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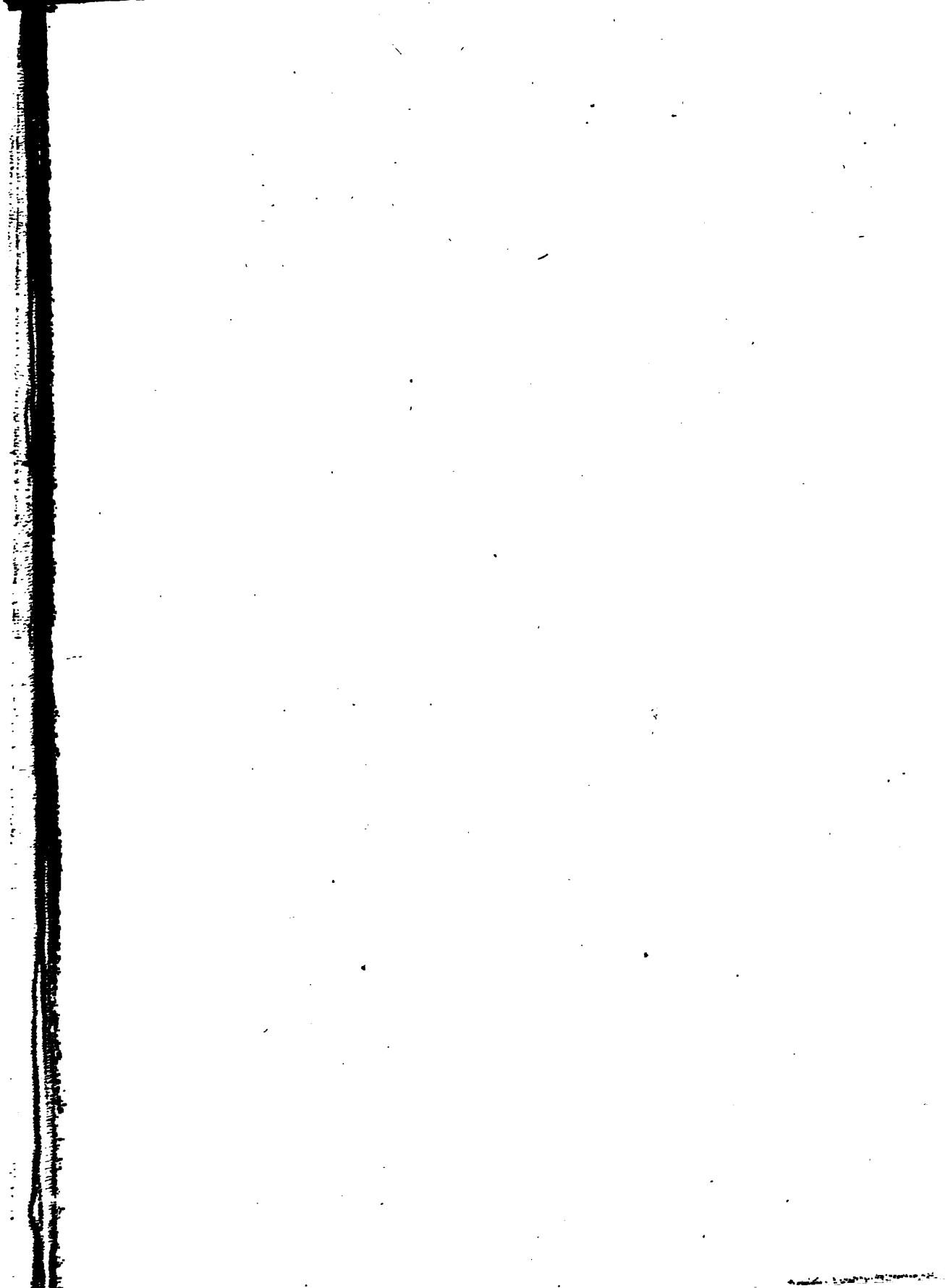
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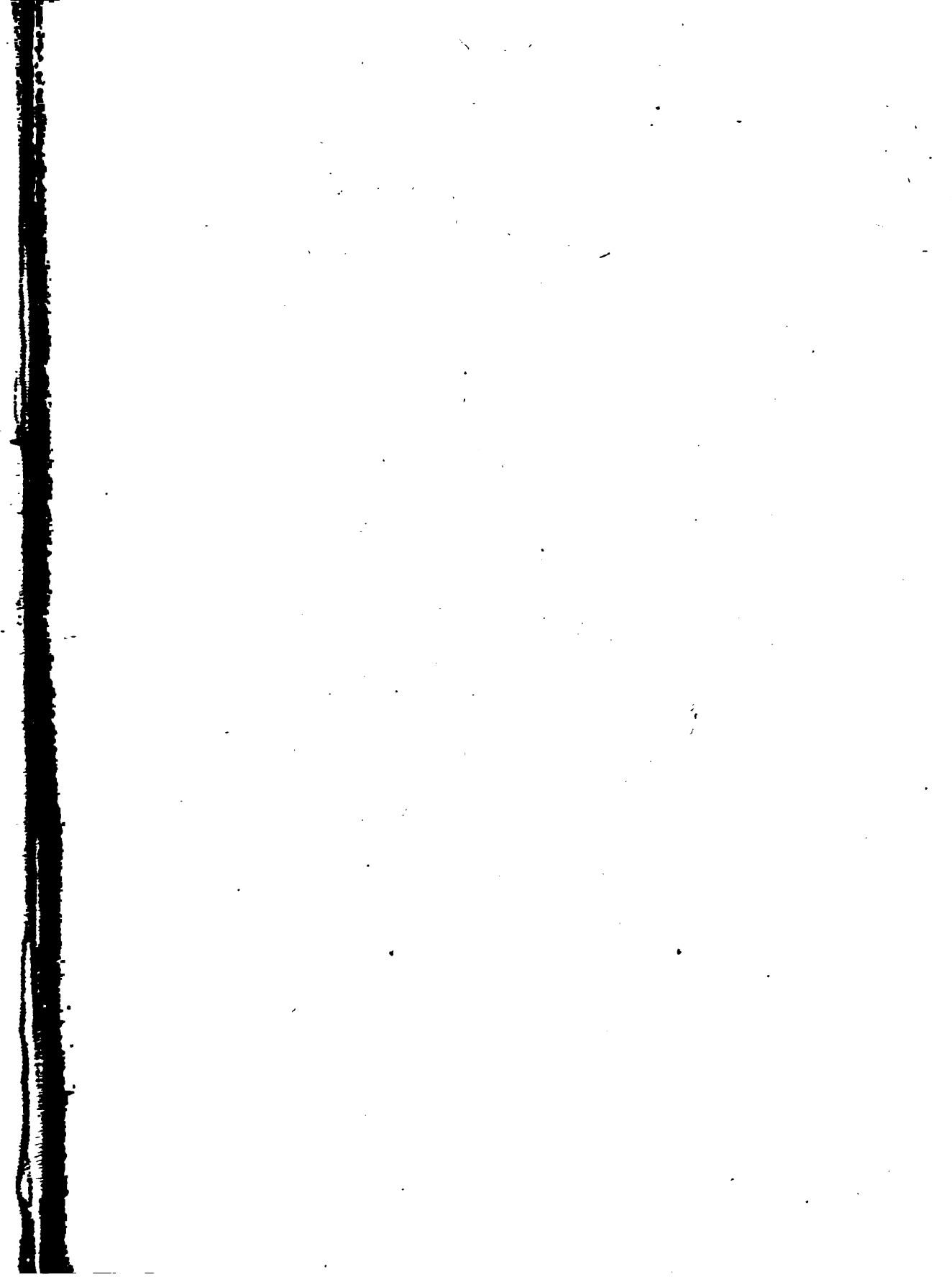
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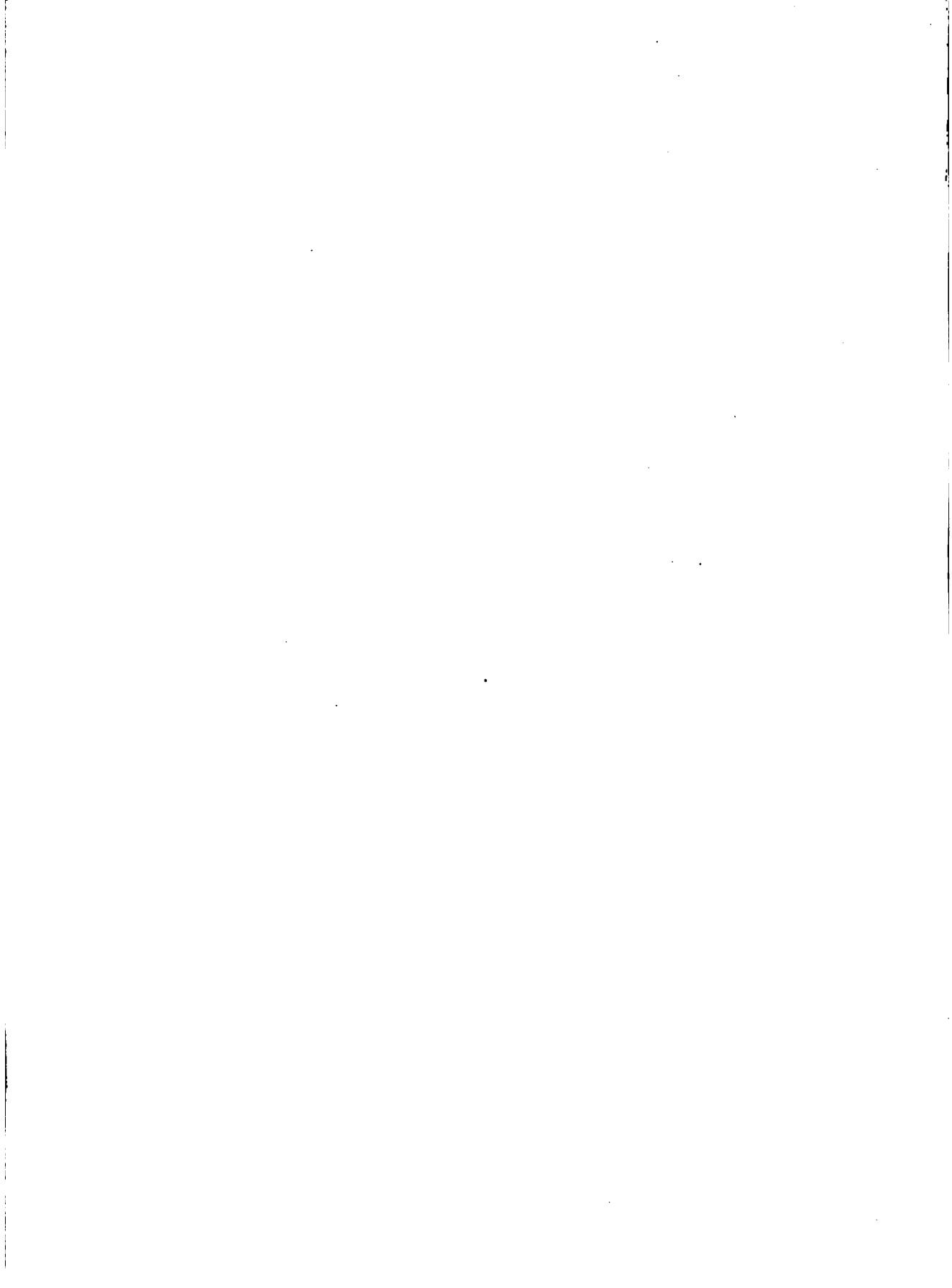
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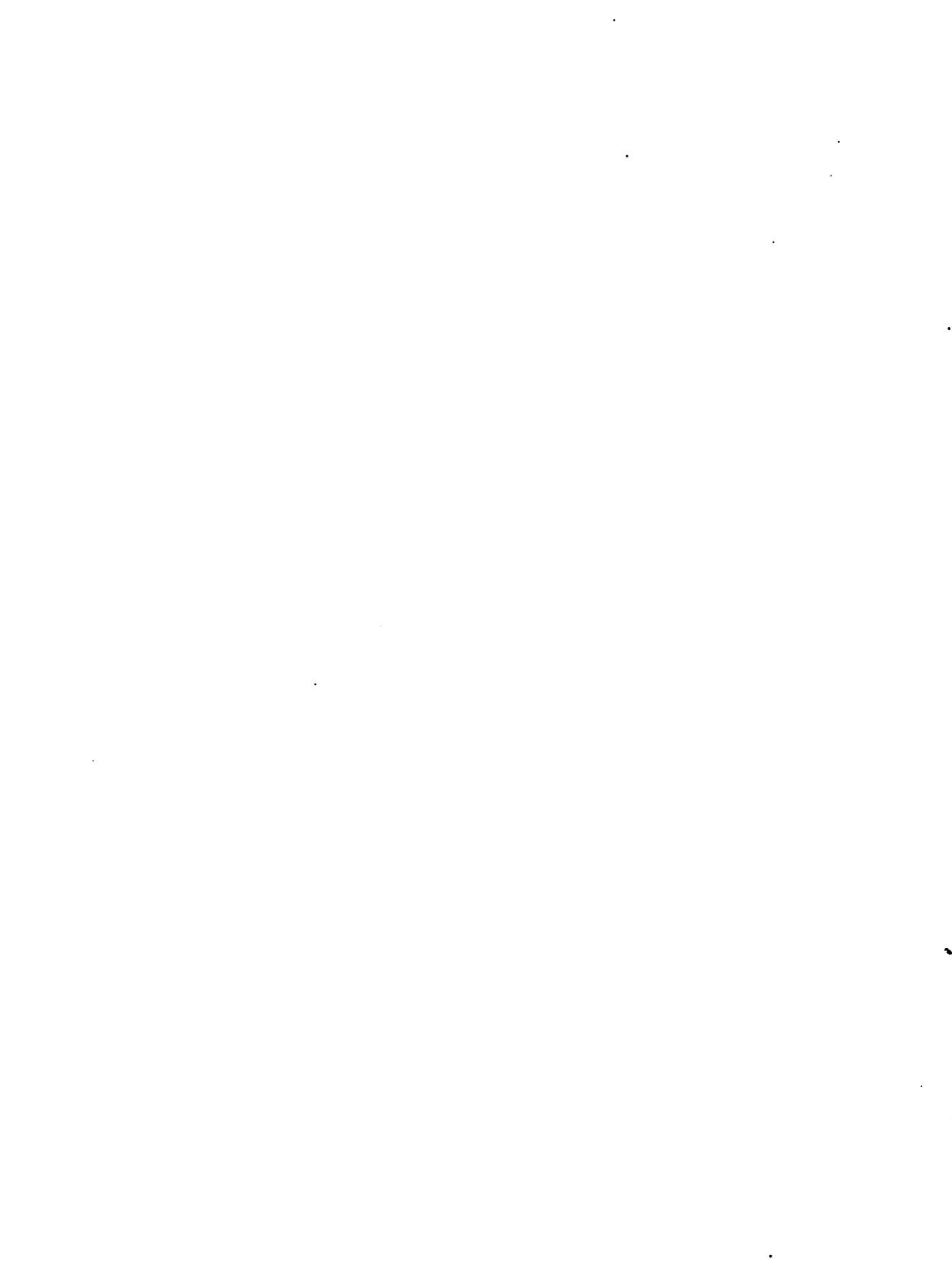


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# American Medicine

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**Another Year Before Us.**—A greeting to the coming year is always in order. Though the calendar may declare the first day of the first month, there is ever a new year before us. 1916 possesses an extra day that has its industrial and social significance in the pay envelope, a day of rest, or an added day for the promotion of personal health or general welfare.

It is interesting to recall that the derivation of the word "calendar" comes from a word meaning an account book. It is so-called because interest in the days of ancient Rome fell due on the calends. We are not prone to take account of the value of the years as they roll by, nor to recognize the advantages which accrued through the institution of the Gregorian calendar in the sixteenth century, though it was not adopted by England until the middle of the eighteenth century, and is just receiving recognition in Russia at this late date.

The inception of a new year in most cities of this country is optimistically consecrated by feasts of rejoicing and riot and the sort of recreational activity described by Dryden as

"A very merry, dancing, drinking,  
Laughing, quaffing and unthinking time."

In a commercial sense, January first is the beginning of a new fiscal year. Taking

stock is the main activity throughout the country. Physicians may perchance contemplatively review the unpaid accounts of the preceding years and reflectively determine upon a new course of action that will preclude unnecessary losses during the year to come. Stock taking is not merely sorrowing over the debts of the past, but is a systematic and orderly process of enumerating and evaluating the stock on hand.

**Today** as never before physicians are under obligations of cataloguing their opportunities, estimating their skill wisely and discreetly, and establishing in their minds their potential powers in the community. It is not true that medicine has been swallowed up in a wave of commercialism. Instinctively reacting to the best traditions of medicine, the leaders in medical thought still see before them the high ideals which have ever dominated the profession and which call forth every ounce of energy in the performance of high civic duties. In the year 1916, stock taking reveals more scientific thought, a wider assortment of instruments of precision, a more thorough dissemination of culture, and a deeper vital interest in public welfare than the profession has ever known.

With the gates of Janus closed within

our country, the opportunities of peace are widespread, and professional service stands forth as a preeminent social obligation. Wherefore, in offering a tardy New Year's greeting, we express the wish that the bright promises of the dawning year may be fulfilled, the richness of life and the joyousness of living may be reaped in bounty. When the year will have passed into history may the new accounting show that our work has been well done, that our stock on hand will have been enhanced in value, and our professional credit will have achieved a notable increase. Prosperity will be achieved with conscience of work well performed, while the admiration and good opinions of our colleagues will be paralleled by the blessings of communities well served.

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**The Baby-Week Campaign.**—Material attention has been given to the importance of birth registration as the basis of vital statistics. Unfortunately, it is impossible to state with accuracy the number of infants born in the United States because an insufficient proportion of our total population is under the careful statistical recording of municipal or state officials. In consequence of our inability to determine upon the actual number of births per year, it is impossible to determine upon the actual infant mortality rate in the United States.

The Census Bureau has estimated that about three hundred thousand infants die annually under the age of one year and that approximately one-fifth of the total mortality of each year consists of children who have not yet passed their first anniversary. The general infant mortality of the civilized world is approximately 130 per thousand live births. The general infant mortality for the United States is approximately

124. France has balanced its diminished birth rate by a reduction in its rate of infant mortality. The birth rate of American born infants of American parentage is practically on a par with the low birth rate of France, but our infant mortality rate among such infants has not yet approached the favorable figures to be found in that country.

Sir Arthur Newshome has stated "Infant mortality is the most sensitive index we possess of social welfare and of sanitary administration." Accepting this for the time being, it is a sad commentary upon this country that we still maintain an unnecessarily high infant mortality rate. The social offence is particularly glaring upon realization that the basic causes of infant mortality are poverty and ignorance. In every investigation of the infantile death rate in large cities or small hamlets, it is manifest that the burden of infantile death is borne by those lacking in worldly possessions, underfed, underclothed, underpaid, undereducated and underdeveloped by social forces.

In order to attack the problem of infant mortality on a colossal scale, the Children's Bureau contemplates the holding of baby-week campaigns on a national scale during the month of March. Fundamentally, the purpose of a baby week is educational. It seeks to awaken communities to the sound economy of reducing the morbidity and mortality rates among infants and the advantages that accrue to the community by promoting effective measures to protect the health and welfare of mothers and children. Such a campaign will present the local facts of infant mortality in a frank and truthful manner and indicate not merely what is being done to offset the death rate but also demonstrate what activities are essential in order to control or lessen the infant mortality.

Inasmuch as the most serious phase of infant mortality occurs during the summer months, such a baby-week campaign stresses the information necessary to encourage the proper care of infants during the heated term, and to stimulate the responsibility of mothers and fathers to secure for their infants the most sanitary environment compatible with their means at that time.

A further function of a campaign of this character, in which indeed physicians should be the leaders, is to arouse the public conscience to the importance of so coordinating existent agencies, and so laying out programs, that duplication or waste of effort will be avoided, and not part but the entire community may help to decrease the communal mortality among babies.

**The proper time of the year for instituting a baby-week campaign** is now, because a comprehensive campaign requires, in large communities, several months of preparation in order to perfect all the details essential to the widest publicity and most careful arrangement of necessary details. To lay the educational foundation for preventive work during the summer time, it is imperative that the climax of the effort of baby saving should be reached in the spring just before the heated term begins to make itself felt. How thoroughly the Children's Bureau has considered the various details of such a campaign is evident from Bureau publication No. 15 which contains numerous valuable suggestions for baby-week campaigns among communities of various sizes.

While the poverty which underlies much of the infant mortality cannot be directly relieved through educational propaganda, the hygienic significance of the interrelation between low wages and infant mortality is not to be underestimated when the facts are

presented with directness and force through pamphlets, lectures, moving pictures and carefully designed exhibits. In so far, however, as ignorance is responsible for a preventable infant mortality, a baby-week is a marvelous educational instrument for spreading light throughout the darkest corners of our cities. It reveals with distinctness the shortsightedness of all educational institutions which continue to teach the dangers of alcohol and tobacco while failing to give children adequate or systematic instruction that will lead them to intelligently care for their younger brothers or sisters, or even to secure the information so necessary when they themselves achieve parenthood.

Educational devices are now recognized as potent instrumentalities in health administration. Physicians should be vitally interested in inaugurating campaigns of this character, in eliciting the cooperation and support of the substantial members of the community. They should be foremost in organizing and directing a social institution whose general benefits are manifest, not merely in the decrease of infant mortality, but in raising the standard of parenthood and alleviating the unhygienic conditions that have so long been a reproach to our communities.

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**The Relation of Wages to Public Health.**—In times gone by the term "slum" had a definite concept in the minds of listeners and readers. Every city had its slum section and pestilential districts abounding in poverty, ignorance and crime. Therein were the most wretched housing conditions, the greatest over-crowding, the most inadequate city service, the greatest poverty and the most vicious characteristics

of home degradation. Together with the lack of food and clothing and general social deterioration were to be found the greatest amount of illness, the highest birth rate, and the highest mortality rate. Cleaning up the slums has come to be a primal object of every health officer.

The relation of low standards of living to the work of municipal health officers has been recognized to a moderate degree but there has not been sufficiently strenuous efforts exerted to remedy the existent conditions by seeking to relieve some of the most important underlying factors.

Surgeon-General Gorgas in an article appearing in the *Journal of the American Medical Association* (December 25th, 1915), indicates a phase of health activity which is most suggestive in its connotations. Inquiring into the factors leading to the general improvement of health conditions at Havana and Panama he writes, "At Panama shortly after our arrival the wages of the men laborers were increased from 11 cents an hour to 20 cents an hour." He further comments: "This large increase in wages caused a general improvement in all living conditions—more room to live in, better food and better clothing. I am satisfied that to this improvement in social conditions caused by our high wages we owe principally our extraordinary improvement in general health conditions." Regardless of whether one agrees or not with General Gorgas' views relative to the effect of high wages, the thought he presents merits careful consideration. It is patent to any thinking physician that the most severe diseases, the hot beds of contagion, the sources of preventable disability, the centers of greatest infant mortality are located in centers of population, the majority of whose residents are lacking in worldly goods. It cannot be

denied that there is an exceedingly definite relation between the economic status of families and their general level of education. It is clear that the physical environment of most families is more dependent upon their financial resources than upon any other single factor conducing to their well being. It is time, then, for workers in the interests of improved sanitary and hygienic conditions to give more than passing consideration to the problem of the relation of wages to public health.

Investigations have been made from time to time indicating that the greatest infant mortality exists in homes consisting of one or two rooms, or in homes where room congestion is more than two persons per room. The physical defects of school children are more common among children living in crowded and congested and poorly built houses, as contrasted with the so-called well-to-do districts. Infant mortality has also been shown to be highest in those sections of the cities where the largest number of families are huddled together, where ignorance is the greatest, and poverty is the most marked.

While the individual factors, as clothing, shelter and food, have been regarded as possessing potential power for improving communal health, or in undermining familial strength, it must be patent that back of these specific factors the question of the family income looms up with startling prominence. Individuals do not elect to live in filth and squalor because of ascetic impulses nor do they prefer to go about poorly clad, underfed and debilitated because of their personal enjoyment of this type of living. Numerous circumstances combine to make this sort of living compulsory for them for a variable length of time, until they have amassed sufficient means to emigrate to a

*Too Short A Ladder!*

"Statistics show that an income of approximately \$850 per year is necessary for a family of five to live and have the necessities of life; in other words, to maintain economic independence. The average income, however, is less than \$600."

section of the community possessed of better physical environment enabling them to maintain a higher standard of living.

**Wages**, it is apparent, constitute a vital and significant element in determining communal health. The family income has been variously estimated, in so far as it is related to establishing a normal standard of living permitting individuals to exist as healthy human beings, physically, mentally, and morally. Many years ago John Mitchell estimated that the minimum wage necessary to maintain a workingman and his family according to American standards was \$600 a year. A special committee on the Standard of Living reported to the New York State Conference of Charities and Corrections in November, 1907, that as a conservative estimate \$825 is sufficient for the average family of 5 individuals comprising a father, a mother, and three children under 14 years of age, to maintain a fairly proper standard of living in the Borough of Manhattan. R. C. Chapin in the *Standard of Living in New York City* writes: "An income of \$900 or over probably permits the maintenance of a normal standard, at least so far as the physical man is concerned."

The total income of a family serves as an index of the standard of living only when the size of the family is known and when the relative purchasing power of the income is assessed in the light of the current cost of the essential commodities necessary for sustaining life. By a peculiar law the price of foods, for example, always rises before wages rise and does not fall as a rule until long after wages have decreased.

In the Massachusetts *Report on the Cost of Living* (1910) it is shown that in 12 prominent industries in the State of Massa-

chusetts the average yearly earnings during 1908, for example, did not exceed \$663.73 in any one of the industries. The average weekly wage in many industries may be high but making allowance for the unemployment constantly existent, the annual earnings are lower than would be indicated by multiplying the average weekly wage by the number of weeks in the year. In the Massachusetts report they divide their wage groups into a high wage group receiving 12 dollars a week, a medium wage group receiving 8 to 12 dollars a week and a low wage group receiving less than 8 dollars a week.

**Wage rates are rising** unquestionably and the increased interest in minimum wage laws is indicative of the general awakening of public opinion to the importance of establishing a wage compatible with human and humane living conditions.

In the *Annals of the American Academy of Political and Social Science* (July, 1913) Scott Nearing discusses wages in the United States and shows that in a large proportion of instances they are insufficient to meet the demand of decent family standards. Assuming that an annual income of \$600 to \$900 a year or \$2 to \$3 per working day is the minimum amount necessary for a normal standard of living in the United States, one can readily appreciate the seriousness of the financial status of workers in this country as revealed by F. H. Streightoff (*The Distribution of Incomes in the United States*). He points out that in 1904 over 60 per cent. of the males at least 16 years of age employed in manufacturing, mining, trade, transportation, and a few other occupations associated with industrial life, were earning less than \$620 per annum, while perhaps 10 per cent. enjoyed labor in-

comes of at least \$1,000. These figures, however, take no account of unemployment.

According to *Bulletin 93* of the United States Department of Commerce and Labor dealing with the Earnings of Wage Earners, the average weekly wage for men 16 years and over in 1915 was \$11.16, and for women 16 years and over \$6.17.

It is evident that subsistence in health is fundamentally attacked by a weekly wage consistently received, of less than \$15 a week. This makes little allowance for occasional unemployment. As long as the weekly earnings in the United States and the annual income of a large proportion of the community continues to fall below the amount deemed necessary by philanthropists, humanitarians, scientists, dietitians and health officers for the maintaining of physical efficiency, there will continue to be a prominent relation between the wages paid in a community and the general health in that community. In order to purchase the healthful environment predisposing to family and social welfare, it is necessary that wages attain higher levels relative to the cost of living.

The slogan of the New York Health Department is indeed true, "Health is a purchasable commodity." The workers of a community are anxious to avail themselves of opportunities to purchase health. Health officers therefore have as a very essential part of their duties instruction of the people as to the wages through which they may secure the advantages deemed so necessary for decreasing the morbidity and mortality in their communities.

Wisely indeed does Dr. Gorgas point out that it is a health officer's function to promote those measures which will control individual diseases. It is equally his duty to

seek to uncover the very rootlets of unhealthful, social conditions, and remove the soil from which such roots take sustenance. Constant effort in behalf of increasing wages is within the scope of the duties of a broad minded, large visioned health officer. He should see in ignorance, poverty and crime, physical degeneration, invalidism, and even death the reflection of inadequate living for the body and starvation of the soul. Is not part of the solution to be found in the unhygienic wages that make healthful living practically impossible for a too large proportion of the community?

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**The Conflict with Tuberculosis.**—Of course, in a public health convention like that of the American Public Health Association, the subject of tuberculosis is bound to crop up, and no one better fitted to discuss the subject in its public aspects could have been found than General Gorgas, who delivered an able address at the Rochester meeting, in which he said in part, that in spite of all that had been done to bring about the conquest of tuberculosis, the question of prevention still remains the most important. In this connection he was of the opinion that the campaign against tuberculosis was much like the yellow fever campaigns in Havana and Panama, in the course of which many measures were employed, any one of which, if it could have been completely carried out, would have doubtless succeeded in controlling yellow fever. It was shown, however, that no one of them could be carried out with complete efficiency. All measures were employed, therefore, that promised any success whatsoever. In the conflict with tuberculosis, General Gorgas did not hesitate to express the belief that hospital care, if every patient could be

placed in a well equipped and properly conducted institution, would undoubtedly stamp out the disease in a few years. Lack of time made it impossible to discuss the prevention and treatment of pulmonary tuberculosis with any great detail. The subject, it is true, has been dealt with almost *ad nauseam*, but a few salient features in connection with its prevention and treatment cannot be referred to or mentioned too often. Thus in regard to early diagnosis; unquestionably there is no detail of greater importance in connection with the whole subject of tuberculosis, for the entire question of treatment hinges thereon. When the disease has passed beyond the first stage, sanatorium treatment is indicated, and when the malady is in the last stage, isolation is the only safe course to be pursued, as it goes without saying, that a person in this stage is very apt to be a public menace.

It seems to be the consensus of opinion that under existing circumstances, tuberculosis cannot be extirpated, because there are too many persons who cannot or will not be treated or isolated in time. Much may be done, however, and much is being done, to stay the ravages of the "white plague," but until Utopia comes, tuberculosis like the poor, will be always with us. Since prevention offers the greatest prospects for ultimate success in the conflict with this dread disease, it must be evident that it is in education, the ceaseless instruction of the people in regard to the fundamental principles of sanitation and hygiene, that the hope of the future lies.

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**Beriberi Among Infants.**—Among the diseases long recognized as possessing a peculiar and mystical fatality, beriberi oc-

cuples a prominent place. It was recognized in China as long ago as 2697 B. C. Its striking tendency to appear among the ill-fed, poorly clothed Oriental sailors was referred to by many writers who called attention to its rare appearance among ship's officers.

The premonitory stages of beriberi are well marked in the languid, easily fatigued, and depressed dyspneic individuals with a slight or moderate edema of face or ankles. The causation of the condition at various times has been referred to malaria, scorbutus, anemia, intestinal parasites, bacteria, protozoa and improper diet. Each in turn was urged, demonstrated, denied and then disproved with the exception of the dietetic phase of the disease.

Patrick Manson writing in Allbutt's System of Medicine, would not believe that dietetic difficulties could be the principal cause of beriberi. To quote his language, "It is quite probable, nay likely, that an unphysiological dietary may cause a disposition to beriberi; but without a specific element in addition it certainly cannot itself cause beriberi; otherwise this disease would be more or less pandemic, and not as now, very often limited to particular districts and even to particular buildings."

Takaki demonstrated that a proper diet, when established in the Japanese navy, was exceedingly effective in limiting the development of the disease among the sailors. From this beginning, investigations slowly revealed the fact that rice played an important part in predisposing individuals to beriberi.

Schaumann attributed the development of the disease to a phosphorus deficiency resulting from the removal of the phosphoric constituents of rice through the process of polishing.

In 1913 Casimir Funk related in the *Brit-*

*ish Medical Journal* (1913—1-814) his success in securing a vitamine, free from phosphorus. At the present time, the vitamine theory is of paramount importance and in so far as beriberi is concerned has successfully demonstrated that there exists a protective substance in the subpericarpal layers of rice. This single fact possesses unusual hygienic value inasmuch as it forms the basis of prevention of beriberi.

Although Hirota in 1888 reported the existence of beriberi in nurslings, the opinion was long held that children under 10 years of age were rarely attacked with the disease.

In 1908 Albert demonstrated that infantile beriberi was entitled to a definite place as a pathological entity in the Philippines.

Vedder, confirming this, has called attention to the important fact that the death rate among infants in Manila is greatest among breast fed children. This peculiar phenomenon is diametrically opposed to our mortality experience in Europe or this country. For example, the infant death rate in Manila during 1909 occurred to the extent of 65.3 per cent. among breast fed children. This unusual and startling incidence of fatality among nurslings was demonstrated to be due to infantile beriberi. The direct origin of the disease in the infant is due to the nursing by mothers, themselves presenting symptoms of the disease. Strangely enough infantile beriberi has not been observed among infants who have been artificially fed. Nursing infants may be observed to be affected by this disease most commonly at about the third month. This experience is distinctly opposed to the general appearance of scurvy which is rarely noted among nurslings, but is not an infrequent occurrence among children artificially fed.

**Infantile beriberi is not a toxemia.**  
Thus stated Chamberlain and Vedder in

1912. After obtaining typical cases of beriberi, they were treated by the administration of a concentrated extract of rice polishings equivalent to about 80 drams of polishings daily. There was no interference with the nursing nor was any other treatment instituted. The infants were given 20 drops of the extract every two hours and improvement was immediate. Within a week's time, most of the patients were completely cured. The treatment of over fifty cases by this method resulted in the saving of every infant's life with the same degree of promptness as lime juice or orange juice acts in the curing of scorbutic infants.

Apparently, then, infantile beriberi is due to some deficiency in the milk of the mother. It is rarely found among well-to-do native families and scarcely worth mentioning among the children of the white race. The early occurrence of the disease is probably due to the fact that during the first few months the infants subsist upon mother's milk alone while, after the fifth or sixth month, the infants receive other foods which supply the substance lacking in the mother's system. It is patent that if the mothers themselves lack the vitamine in their own systems, they are incapable of supplying the fetus with the amount needed to enable the infants to enter life with sufficient quantities for their protection.

The prevention of infantile beriberi is simple. It merely requires the elimination of an exclusive polished rice diet and the establishment of the habit of utilizing undermilled or unpolished rice in the dietary.

Heiser recommended a bill which has been repeatedly introduced into the Philippine legislature, but has not yet been passed, to provide for the establishment of an internal revenue tax on all polished rice in order that mere questions of economy would force the

natives to consume the unpolished rice. They would thus protect not merely the adult population but the infant population from the devastations of beriberi. One may even raise the question as to whether the Filipinos are ready for self-government until they can recognize in this law the national advantages of a rational protective dietary at a cheaper cost, financially, medically and socially.

use of common instrumentalities as pencils, towels and similar articles unfortunately too frequently used in common. Personal cleanliness is of the utmost importance in restricting the spread of the disease, and the abolition of common towels and wash pans is essential in its elimination.

Among the Indians the exact origin of the infection is unknown, but its prevalence has been recognized for many years. Dr. Harrison, formerly of the Indian service, stated that he had observed no school that has been wholly free from trachoma infection. It is a sad commentary upon our national interest in the preservation of the Indian population to realize that approximately 20 per cent. of the total Indian population is infected with trachoma. The well known indifference of the average Indian to his personal habits, to dirt in connection with his general surroundings and his poorly organized home possibly account for part of the extension of the disease. The disinclination of the red man to submit to the continued and painful treatment necessary for its cure tends to continue his existence as a contagion bearer to others among his tribe.

**The Trachoma Problem.**—According to the United States Public Health Service, there are at least 33,600 cases of trachoma in the state of Kentucky and 20 per cent. of the Indians in our country are infected. Since 1897 trachoma has been classified under the head of dangerous and contagious diseases. Aliens are deported, if found suffering with this disease upon arrival at our hospital ports of entry.

If one were to inquire as to the origin of trachoma in the United States, the only satisfactory answer available is that it was imported from European countries by immigrants. During 1913-14, 5,755 aliens were deported because of trachoma, the largest proportion of whom came from Italy, Russia, Syria, Greece, Spain, and Turkey.

The recognition of trachoma is of immense importance not merely because of its contagious nature but by reason of its incapacitating effect upon those afflicted. It has been estimated that the average earning capacity of trachomatous persons is less than one-fourth of the average earning capacity of individuals free from this disease. There is little question that the spread of the disease by school children of foreign parentage is effected through their daily intercourse, the playing of games and the

**The economic effect of impaired vision** diminishes the value of the afflicted to the community. The difficulties of cure must be surmounted as the cure requires prolonged and painful treatment and is not always accompanied by the restoration of normal vision. Of more practical concern is the prevention of trachoma through the improvement of the general living conditions of the poor and the raising of the standards of living in infected communities. This calls for widespread education, particularly in Indian sections and in the infected states, as to the nature of trachoma and the con-

ditions favoring its spread. As a contagious disease it should be uniformly a reportable disease. Fortunately, 14 states already demand the reporting of trachoma to the health authorities.

Blindness, which is preventable, is a sad commentary upon a boasted civilization. The National Committee for the Prevention of Blindness (*Bulletin No. 6—Trachoma—A Menace to America*) calls attention to the wide distribution of trachoma in the mountain sections of Kentucky, Virginia and West Virginia, in southern Illinois, in Arkansas, in the mountains of southern Missouri, and among the Indians on all reservations except in New York State. The wide extent of the disease, thus indicated, evidences the need for a thoroughly organized campaign, not merely for the alleviation of the symptoms among those now infected, but for prophylactic purposes.

If our position among the nations is to be enhanced, every effort must be put forth to limit the development of blind citizens or the impairment of vision of immigrants only temporarily residing within our borders. To realize that some schools play a part in the spread of this disease is to recognize a state responsibility, particularly in view of the fact that education is more or less compulsory throughout the nation. To develop the brain power of potential citizens at the sacrifice of vision is hardly to be construed as a wise social, economic, or educational policy.

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**Is Juvenile Diabetes an Infection?**—Diabetes mellitus in childhood and youth is such a uniformly fatal disease that it must be clear to all that as yet we do not have a proper understanding of its etiology.

Numerous theories as to its causation have been advanced and it is generally conceded that the pancreatic element is as pronounced and constant in children as it is in adults. It has been suggested that many a child has died with diabetes mellitus, from virtual starvation, since the toxic high-proteid diet and the almost complete elimination of the carbohydrates, that was in vogue until quite recently, did not give sufficient nourishment to the growing cells. On the other hand some think that an important cause of the high mortality is because it is so difficult to enforce the necessary dietetic restrictions for children with whom it is not always possible to reason. Be this as it may, there is yet much to be learned about the causative factors in juvenile diabetes.

Thinking to gain some additional information upon this obscure subject, two Dutch physicians, Delange and Schipper (*Nederl. Tijdschr. v. Gen.*, Aug. 7, 1915) have made a thorough search of the literature. They find that between 500 and 600 cases of diabetes in children and youth are on record. Recovery was mentioned in about 30 cases out of the whole extensive series, and even these were not traced for sufficiently long periods after the supposed cure. They also report eight cases which came under their own notice. It is, at least, encouraging to note that the incidence of diabetes in children was not high—one case in about eighteen hundred children entering the hospital for various causes. All these cases terminated fatally, the duration of the disease varying from 8 months to 2 years and 5 months.

An interesting coincidence which may be remarked is the relation of febrile reaction to diabetes. Generally in adults one finds a low range of temperature, while in children there may be a slight rise. The onset of the

diabetic manifestations in children is usually quite sudden, the progress (as compared with the same disease in older persons) is rapid and the prognosis is especially grave. Cases which have come to our notice in several respects have reminded us of the aspects of an acute infectious disease; and it is quite possible that the pancreas is actually the seat of a bacterial invasion. It is quite true that the symptoms differ quite markedly from those of an acute pancreatitis and that the autopsy findings have not definitely substantiated this position, but at least they have not disproved it, and we have a fairly well formed suspicion that there is a more or less important infectious element in diabetes mellitus in childhood and youth which, if it can be differentiated and understood, eventually may enable us to control this disease in a manner similar to that which is now so successful in many other infections.

The extreme mortality from juvenile diabetes should be an incentive to us to study it the more thoroughly—it should not be difficult to chart the temperature variations of 50 or 100, or even more, cases, or to keep track of the leucocytic relations and other factors which are normally considered in the study of an infectious disease or an infection—and we believe that to view the subject from this somewhat different angle, may open up new possibilities in its control.

**The subject of chemotherapy**, to which we have referred on several occasions in previous issues of AMERICAN MEDICINE, is looming larger every day. Germany has been the one country where chemical research has flourished and while in certain quarters in this country there has been a disposition to condemn the multiplicity of German chemical discoveries for therapeutic use, especially those of synthetic origin, there can be no denial of the fact that medicine has benefited enormously from the industry and productivity of German chemists. There could be no better proof of this than the widespread inconvenience and annoyance occasioned by the curtailment or more or less complete discontinuance of drug imports from Germany as a result of the war. The wail of wrath and indignation that has been heard in the land tells in no uncertain way how important a place many of the so-called German synthetics have filled in every day practice.

It is intolerable that the practice of medicine, especially in non-belligerent countries, should be handicapped by war. The rights of the sick have always transcended all others. Belligerents, previous to the present conflict, have respected these rights and offered no obstacles to traffic in drugs, instruments or other supplies for humanitarian purposes. This present war, unfortunately, has been characterized by a more or less complete disregard of former standards, with the result that much unexpected injury and serious inconvenience have been caused people of neutral countries. In respect to foreign made drugs the situation has become particularly acute, inasmuch as their importation has been almost completed stopped, and letters patent issued by the American government prevent any but the foreign owners or holders thereof from manufacturing these remedies, which they with rare exceptions, have no facilities for in this country. The suggestion has been made that the Government should, owing to the conditions and in the interests of the af-

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**The Violet Rays in Ultramicroscopy.**—Our capacity to see certain microorganisms, as for example, those responsible for scarlet fever, measles, mumps, etc., may be possibly augmented by a recent discovery by an Austrian scientist. He found that the ultraviolet rays may be used to increase in a noticeable degree the resolving power of the microscope. The rays, it is well known, are highly effective in photography, though they are invisible to the eye.

flicted, abrogate these patents and give American manufacturers full rights to make and market these drugs. Disagreeable as the situation is, and objectionable as are certain fundamental features pertaining to drug patents, our Government is committed to a definite policy. Preservation of the Government's honor and integrity requires that the holders of patents under its laws, shall be given the protection agreed upon and promised. To nullify patent laws, no matter what the stress, would be a disgrace and leave an indelible blot on our national reputation for honesty. If, as a means of relieving a serious condition temporarily, the Government should see fit to suspend any patent for a short period and allow certain important remedies to be made in this country, every assurance should be given that such action is for emergency purposes only, and in no way intended as an appropriation or invalidation of the rights that have been given. Full provision, moreover, should be made to protect foreign interests during the period of suspension of their patents, and as soon as they can resume operations these, under their rights, should be restored without the slightest question or prejudice. This is the only course compatible with American standards of honor and principle.

**The present drug situation** emphasizes the great need in this country for research in the field of chemotherapy. We have sadly neglected this important subject and as a consequence the United States can lay claim to very few great discoveries in this direction. In organotherapy and other special fields of drug research there is less barrenness, and some very notable contributions to therapeutics have been made. In other branches of medical science American investigators have also been very successful and made many valuable and far-reaching discoveries. All this makes it doubly surprising that our research workers have been so indifferent to the opportunities for chemical investigation and the evolution of new drugs. Nevertheless, this has been the general attitude, the profession apparently being content to leave pharmacologic and chemotherapeutic research to foreign workers. The baneful and disastrous consequences of such indifference have become only too apparent in the shameful dearth of Ameri-

can discovered drugs that has been exposed as the supply of foreign drugs is cut off. Had American scientists given the thought and attention to drug research that the importance of the subject warrants, the American practitioner of medicine would not be as inconvenienced as he bids fair to be, for he would not have found it necessary to depend so largely on foreign made products.

The great outstanding need of the hour, therefore, is the immediate foundation of an effective institution for chemotherapeutic research. With the problems awaiting solution and the opportunities for developing information of unlimited importance to the science of medicine, there is no way in which philanthropy could do more for humanity than to make possible the establishment of such an institution. Ehrlich is dead and the great research institution of which he was the head and moving spirit, by this misfortune and other conditions will be unable for a long time to go on serving medical science as it has in the past. There never was a more auspicious time for the development of a great institution to take up the study of chemistry in relation to the treatment of disease, and carry forward this great work that contains such wonderful possibilities for the relief of human suffering. It is to be hoped that some wealthy man can be shown the enormous benefits to be derived from such an institution, and how by making its foundation possible he can meet the most urgent need in connection with scientific medicine today, the need for taking advantage of the unlimited resources of chemistry.

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**The Grippe.**—The nation is in the throes of inconvenience and suffering from a group of respiratory diseases conveniently termed "the grippe." Influenza dates back at least to 1173 A. D. when it ravaged Italy. The early pioneers in Massachusetts and Connecticut were visited in 1627. While occasional appearances of the disease were noted for a number of years, its savage qualities were scarcely recognized in the United States until it became epidemic in 1889 after traveling westward via Bokkara, Petrograd, Berlin and London.

The presence of grippe is always more

markedly felt during the month of January. In fact, the first month of the year is the most severe month with the exception of March in fatality from all respiratory diseases. During 1913, there were in the registration area 2,135 deaths from influenza, 7,289 from pulmonary tuberculosis, 1,665 from bronchitis, 7,853 from lobar-pneumonia, and 4,198 from broncho-pneumonia. This large number of deaths from afflictions of the respiratory system is not as clearly understood as would be expected from the fact that there is a more or less specific etiology for grippé, tuberculosis and pneumonia. The interdependence of these various diseases is not clearly defined. In fact, there appears to be some question as to the specificity of the etiological factor usually described as underlying the conditions clinically called grippé.

Mathers (*J. A. M. A.*, 1/1/16) calls attention to the fact that in the studies of cultures from the victims of the grippé epidemic in Chicago, the *bacillus influenzae* and the *micrococcus catarrhalis* were not found. The most constant bacteriological finding established was a hemolytic streptococcus, although there were frequently associated pneumococci.

Statements from the Health Commissioner of the City of New York would indicate that the New York Department suspects that the epidemic raging in New York City has been due largely to pneumococci of various strains rather than to any other type of organism. The bacteriological reports revealed frequent infections with *bacillus influenzae*. While Pfeiffer's *bacillus influenzae* has been honored since 1892 as the cause of grippé, the more modern studies serve to raise a question as to whether this honor should not be divided among several organisms. Probably many cases incorrectly classified as grippé are infections by *bacillus catarrhalis*, pneumococci and other organisms.

While the development of industrial cities may be responsible for the dissemination of many diseases, particularly because of the congestion of population and the numerous daily contacts rendered essential through schooling, industrial work, recreational activity, and transportation, it seems certain that city life is not essentially responsible for the continuance or the spread of grippé. A larger ratio in the mortality from in-

fluenza exists in rural districts than in urban sections. To illustrate, during 1913 the death rates in cities and rural districts were respectively in Massachusetts 6.8 per cent. and 17.7 per cent.; in New York 6.6 per cent. and 24.3 per cent.; and in Washington 5.3 per cent. and 7.6 per cent. The phenomenon merits particular attention in view of the fact that the educational propaganda for limiting the spread of grippé is largely devoted to the elimination of contact infection through the prevention of indiscriminate or careless coughing, sneezing and kissing. Possibly, the greater mortality in rural districts may be due to the fact that there is a slightly larger proportion of individuals over the age of 65 years living in rural communities. According to the census of 1910 there is 4.6 per cent. of the population living in rural communities as opposed to 4 per cent. under urban conditions. It is doubtful, however, if this slight disparity would influence the total mortality to the extent evidenced by the death rate from grippé.

The average age at death from influenza is 56.7 years while the median age is 67.1 years. It is obvious, as statistical figures proclaim, that the maximum toll from the ravages of grippé is taken after the age of 60 years. Thus from the economic point of view, the gross disturbance of economic conditions by the fatality of grippé is of far less serious consequence than is, for example, a similar mortality from tuberculosis with its concomitant years of invalidism. For a large community, however, to suffer the serious inconvenience of having a large proportion of its adult population afflicted by an epidemic, even of a mild type of grippé, results in a serious economic loss, with industrial retardation, and an accompanying temporary paralysis of social life and activities.

It is possible that the issuance of circulars and the publication of cautionary pamphlets, the use of posters and public lecturing may to some extent mitigate the spread of the disease. It must not be forgotten, however, that the general rules laid down for the protection of the community, in so far as they involve personal hygiene are bound to react favorably upon the decrease of all contagious diseases. The droplet theory of infection occupies the center of the etiologic stage and in throwing the spot light of publicity upon this source of contagion whole-

some benefit must necessarily result to the entire community. Whether as a result of such protective education influenza may be limited or controlled is a practical sanitary question.

It is needless to point out that from the standpoint of prophylactic inoculations or specific therapy, it is first essential to determine with accuracy either the single specific organism or the group of organisms which are responsible for this disease. The *bacillus influenzae*, the *diplococcus pneumoniae* and the streptococci are all recognized as the foes of men. Which is the principal particular enemy warring in this country at the present time deserves widespread investigation by bacteriologists, clinicians, and health officers throughout the land.

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**The Horrors of War!**— Judging from the abstract made by the *Journal of the A. M. A.* (October 23, 1915) of a paper by Kohnstamm on "Organotherapy in War Medicine: Conception of Dyshormonism" (*Therapie der Gegenwart*, Berlin, September LVI, No. 9) there is no end to the tragic conditions imposed by modern warfare as exemplified by the gigantic struggle now taking place. The abstract states as follows:

"He regards neurasthenia in soldiers as having a somatic basis in molecular disturbances or changes in the nerve tissue like those which distinguish magnetic from non-magnetic iron. \* \* \* In one of exophthalmic goiter in a soldier, tachycardia changed to bradycardia as jaundice developed and then returned again as the jaundice subsided. Hypophysis extract seemed to combat insomnia effectually and also proved useful in a case of periodically recurring functional angina pectoris of vasomotor origin. As the attacks returned regularly ten days before the menstrual period he assumed that ovarian functioning was responsible for them, and hence aimed to give the antagonistic hormone in hypophysis treatment." \* \* \*

The "boys in the trenches" have suffered much, but if added to all they have undergone, they must henceforth carry the burden of a new function, General Sherman's designation of war will take on a new significance.

**Interpreting the Drug Laws.**—It will be recalled that we have referred several times in the past few issues to the confusion existing in regard to the drug laws, especially in respect to the question of physical examination and the intent of the law. As we go to press we learn that the case of the doctor who was arrested for sending a day's supply of drug to one of his patients by the man's wife, has ended with the acquittal of the defendant. It has been our good fortune to get a copy of the decision and while it follows more or less closely the views we have held concerning the meaning of the law, the language is so direct and explicit that we propose to print it in full in our next issue. The decision was delivered by Hon. John J. Freschi and is a masterpiece in its grasp of the law, its lucid phraseology, and its general comprehension of the facts of the situation. A decision so sound, sententious and enlightening is highly gratifying, for it exemplifies the good our courts can do in bringing vague uncertain laws from the shadow of obscurity into the clear light of reason and justice. Judge Freschi's verdict will be deeply appreciated by medical men generally for its common sense and keen understanding of the medical problems involved. It is a matter for great satisfaction that the interpretation of this vague and obscure law that promised so much annoyance to the profession, was left to a man of the type of Judge Freschi.

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**A Bowl Fight Fatality.**—The "safety first" campaign might well be recognized by our institutions of learning. During the early history of universities flogging systems and hazing appeared to have a prominent part in the educational program. The recent death of a student at the University of Pennsylvania during the annual bowl fight between the freshman and sophomore classes again calls attention to the foolish collegiate methods of determining class superiority. Athletics and mass strength may have some value but brutal tests of class weight and class courage are hardly in line with modern ideas of student training. There is little sense in crushing out a student life without the involvement of high ideals or the introduction of any principle worth struggling for. Only the severest condemnation can be visited upon institutions promoting dangerous class struggles whose

only excuse for existence lies in the fact that they have been annual events.

It would be interesting if colleges were to establish the class combats with actual educational standards. It is difficult, however, to contemplate an annual freshman sophomore debating contest, a musical scrimmage, or a choral encounter. There might even be an advantage, though with little less excuse, if each class were to select representatives to defend the class honor in types of ordinary athletic contention in wrestling, boxing, shooting or track games. The corner fights, bowl fights and massing of brawn without the evidence of brains have no place in modern institutions supposedly existent under the banner of education.

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**Progress or Otherwise.**—Just how much or how little a man may know is sooner or later sure to be shown, he himself disclosing quantitatively as well as qualitatively his makeup. The exhibit is sometimes human—more often pathetic—in that he has not the realization of an infirmity, a sense of his attitude towards others. The veneer of education and refinement is thin on most of us; we are all sons of Father Adam and have inherited many of his frailties as did Cain and much of his better self as did Abel. Cain asked his father, was he his brother's keeper, and this question has come thundering down the ages until it is still propounded in all countries and in all tongues. The attitude of the question is still one of negation. The aphorism uttered by the Prince of Peace "Do unto others as you would have others do unto you" is as little observed today as when uttered. It is doubtless true that all men are born equal in so far as a right to live is concerned, but traits inherited or acquired are still in evidence to make all men unlike as in the days of Cain and Abel. And the pity of our existence is that all too often it is the Cains who rule.

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**An American Arsenobenzol now Available.**—It is a matter for considerable pride that the well-known antisyphilitic, salvarsan, is being replaced, temporarily at least, by a preparation made in the Dermatological Laboratories of the Philadelphia Polyclinic.

Arrangements have now been satisfactorily made not only to market this essential remedy in this country; but to obviate legal difficulties with the local representatives of the German manufacturers.

The remedy is known by its abbreviated chemical name—arsenobenzol, and for the time being is sold direct from the Philadelphia Polyclinic in tubes of 0.6 gm. and 0.4 gm., at prices identical with that of salvarsan before the war, i. e. \$3.00 and \$2.50 per tube, respectively.

This new drug has been tested with extreme care and the toxicity and therapeutic tests on animals give substantially the same results as Ehrlich's preparation. However it is slightly less soluble and the usual mode of preparation for injection is exactly the same as that of salvarsan, save only that the solution requires to be filtered.

The business side of this new venture is of unusual interest. While the manufacturing cost is very considerably below the selling price, it was found necessary, to avoid future complications, to maintain the price at the same antebellum level; but an arrangement has been made to supply hospitals and dispensaries (for charity cases only) with the 0.6 gm. tubes at \$2.00 and the 0.4 gm. tubes at \$1.50. All the profits will be devoted solely to furthering the scientific research of the institution from whence this remedy comes.

Doubtless plans will be completed later to distribute this American arsenobenzol throughout the country, but in the meantime it may be had direct from the Philadelphia Polyclinic at the prices mentioned above.

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**Emetine in Psoriasis.**—An accidental experience with emetine hydrochloride leads a writer in *Therapeutic Notes* (Nov. 1915, p. 131) to believe that this remarkable remedy exerts a favorable influence upon psoriasis.

The first case received a half grain of emetine hydrochloride by hypodermic injection for a severe alveolitis. Soon after the injection the skin manifestations, which were, of course, of long duration, began to disappear. Three cases of psoriasis have been treated with emetine with highly satisfactory results and while it may not develop into a specific for this troublesome dermatosis, it appears that it is well worth trying.

## WHAT THE WAR HAS TAUGHT US IN REGARD TO MEDICINE AND SURGERY.

BY

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The large proportion of infected wounds in this war will be chargeable to the intensity and ceaselessness of artillery fire, and to the nature of the trench fighting. In no preceding war, has artillery played so large a part, therefore the proportion of artillery wounds, to the total, never has been so large in any previous war. That is the first thing to record in this connection.

The second and the more serious thing, is the fact that by the nature of the trench fighting, it frequently becomes impossible for the contending forces to leave shelter so that they may gather up their wounded. Unusually large proportionate numbers of the fighters suffer from lacerated wounds, and the wounded often lie without attention, for an unusually long time, upon the field where they have fallen. Both artillery fire and trench fighting, make rescue of the wounded difficult, for they render the open reaches of the battlefields virtually impassable.

Thus, forced to remain unsuccored upon the ground for hours, and, sometimes, even for days, every condition favorable to wound infection is created, and a situation,

which very nearly approaches that of the old days before the development of aseptic surgery results. The medical corps are skilled in and equipped, for the most elaborate work in the prevention of infection, but little opportunity is given them for the exercise of the one or the use of the other.

The unprecedentedly large proportion of medical officers, among the killed and wounded, gives the situation in this war a gravity hitherto unknown. Bullet wounds are clean, unless an infection is carried into them, from the penetrated clothing or the skin of the victim. Most of them would heal as readily, if they immediately could be protected, against subsequent infection, as do the wounds made in hospitals by surgeons' knives.

But this is true only of bullet wounds, not of artillery wounds. During the progress of the struggle, the statement frequently has been made, that 80 per cent. of the wounded quickly get back into the firing line. This can refer only to those wounded by rifle fire, not to those wounded by artillery fire.

Rifle-bullet wounds during this war, probably would show an unprecedentedly small percentage of fatalities, if the trench fighting and artillery practice did not so frequently make it impossible to gather up the wounded promptly and get them to the field hospitals.

But despite even this, some advance has been made. As in our civil war, tetanus

has developed in a very large number of cases, but now there is an antitetanus serum, which is definitely effective, while at the time of our civil war nothing of the sort existed.

Tetanus is the product of an earth germ, likely to be especially plentiful in sections which long have been settled and under cultivation. Nearly all the battles of this war, so far have been and in the future, must be fought in just such country.

Infection from the so-called "gas bacillus" seems to be unprecedently frequent, and such infections are fatal, in a very large proportion of cases. This infection creates gangrene through the entrance of the bacillus with dirt into the wounds. Gangrene follows, and the resultant death of tissue is accompanied by generation of the "gas" which gives the bacillus its popular name.

This form of infection was recognized years ago, but it seems to be occurring more frequently in this war than it ever did before. The frequency of this infection, like the frequency of tetanus infection, probably is due to the fact, that this war's wounds are being administered in battles fought on fields which long have been the sites of human habitation.

Typhus is looming up very threateningly in the Eastern theatre of war, particularly in Serbia and Austria, and ere long may appear in the Western armies. Much has been learned of this disease in recent years.

For this new knowledge the world is indebted principally to two American investigators, Drs. Anderson and Goldberg, whose most notable work was done in Mexico City some three years ago, where these scientists discovered that typhus is due to the bite of a louse, as yellow fever and malaria are due to the bites of mosquitoes.

During this investigation an American surgeon named Ricketts fell victim to his zeal, perishing of the disease, as Lazear martyred himself to the public good, during the United States Army's investigations into yellow fever in Cuba. Nicole, a Frenchman, had done something before this in Morocco. He, also, developed the louse-transmission theory which now has been established. Recently, Dr. Harry Plotz, of Mt. Sinai Hospital, New York, has gone far toward giving humankind the whip-hand over typhus. He has fully identified and isolated the germ of the disease.

The infection has reached the armies in the Eastern theatre of war. There is reason to fear, if it spreads to Western European armies, that it will find among them conditions favorable to its propagation and that a tragic spread of the disease will follow. Conditions of life in the field—especially among the trenches—will make its control exceedingly difficult, if it once gets any notable headway. Cholera is less likely to play a serious part in Europe during this war than would have been the case had a similar struggle occurred even ten years ago.

The discoveries which have brought about this improvement in conditions, were made by a German scientist named Haffkine, who has developed a reliable vaccine. Koch isolated the bacillus years ago. Haffkine first inoculated patients with it twelve or fourteen years ago in India.

Other important developmental work was done in Spain. The Haffkine serum has been used extensively among civil populations suffering from or threatened by this plague, and with really notable success. It has not yet been given a severe military test under war conditions.

Typhoid fever has been especially dis-

astrous in war times, in the past, through its inevitable spread from the military to the civil populations. Typhoid vaccination, however, already has saved scores of thousands of the European fighting men.

We have received authoritative reports of conditions in the trenches, but probably frost-bite caused much misery during the winter months, and it seems likely that rheumatism must have followed the fighting in the semi-flooded trenches of the spring. Of these matters, however, we have no definite knowledge at the present time.

Perhaps the matter to which I have referred already, the high mortality is regarded as one of the most serious medical problems of this campaign. In the days of old, when artillery was of comparatively short range, it was possible to put field hospitals actually out of range of the guns.

A field hospital located at a place sufficiently distant from the firing line to be out of the range of the guns, in these days would be so far from the battlefield that it would be of no practical value to the fighting force.

So doctors and other attendants are under fire as they never were before. The resultant mortality among medical men and nurses has been unprecedented. It is even probable, that the mortality from gunshot wounds among officers in the hospital service has been as high as that among the officers of the line.

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**Croup.**—Turpentine and sugar, (*Med. Fortnightly*) three-drop doses taken every half hour, and topical applications made to the throat and chest by flannel cloths wrung out of hot water and saturated with the turpentine (the applied cloths covered with dry compresses) is considered a sovereign remedy in croup.

## A CRITICISM OF THE "WHOLE-MILK" METHOD OF FEEDING INFANTS.

BY

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During the last few months a correspondence has been maintained in certain of our English medical journals on the advantages and disadvantages of the "citrated-whole-milk" method of feeding. Dr. C. W. Vining of Leeds has recently championed the cause of this method in the pages of the *Practitioner*. As I consider many of the arguments which he adduces in support of his views to be at variance with the general principles of physiology, I venture to submit the reasons on which my views are based in the following article which may be of interest to practitioners on the other side of the Atlantic. The article in question is published in the November number of the *Practitioner* (England).

Before discussing the question of the best food for infants who are condemned to artificial feeding I would like to make it perfectly clear that I hold no brief for any particular kind of food. On the other hand I have very deep-rooted convictions that the principles of "physiological feeding" or the adaptation of the food to the individual requirements of each particular child must be the basis of every sound method of feeding.

In the main I agree with Dr. Vining that it is a method which gives good results. My contention, however, is that it does not give "the best" results. Some eight years

ago when I succeeded in inducing Dr. Ronald Carter to accept the post of medical officer to a new Infant Consultation Center in Kensington, I represented to him that extremely interesting light might be thrown on the value of the "citrated-whole-milk" method if he were, for a time at least, to use this method exclusively in the feeding of the large number of infants which it was anticipated would attend the Center. The results which he obtained proved that it was a good, simple and generally satisfactory method for general use among the poor. As it happened I met Dr. Carter a few days ago and he now tells me that he has abandoned the exclusive use of this method, and at the present time employs methods which involve the application of the principles of "physiological feeding." I am very glad that we have on record Dr. Carter's experiences with the "whole-milk" method, for it is difficult to judge of the possibilities of any system of feeding unless one has had considerable experience in manipulating it, as far as its limitations allow, to the varying requirements of a large number of differently constituted infants.

In my own Infant Consultation in Marylebone, where I have a large number of students to teach, I have thought it unwise to confine myself to any one particular kind of food, or any one particular method of feeding, and among other methods I occasionally use the "citrated-whole-milk" method; chiefly, however, for the purpose of demonstration, so that I cannot claim to have the experience of either Dr. Vining or Dr. Carter with this particular method.

But after many years experimentation I have come to the conclusion that provided one is familiar with the principles of physiological feeding it makes very little difference what food one employs; whether for

instance one uses dairy-milk so-called, dried milk, condensed milk, or even pure samples of the independent elements of which cow's milk or any other milk is compounded, provided one complies with certain essential conditions which may be stated as follows:

(1) The necessary elements for growth, maintenance, heat-production, energy-production and the elaboration of secretions must be supplied in the proportions, and in the quantities required in each particular case.

(2) These elements must be presented in a form capable of being digested and assimilated, and otherwise suited to the specific physiological make-up of the infant to whom they are supplied.

(3) The food must be of such a nature as to exercise and develop the latent digestive capacities preparatory to a most extensive dietary.

Each individual, young or old, has his own specific physiological make-up, a make-up which depends on an enormous number of varying conditions, which include racial, hereditary, familial and individual idiosyncrasies, the latter consisting of tendencies or habits to digest, absorb, metabolize, secrete and excrete in some particular way. These idiosyncrasies must be humoured by corresponding adaptations in the diet if the best results are to be obtained, unless indeed we can rely on the infant adapting itself to the specific qualities of the food which we supply. This is where my views of feeding appear to differ from those of Dr. Vining. He believes, if I mistake not, that one can so modify the specific physiological make-up of the average infant that the latter can be made to subsist on the dietary which nature has ordained should be the food of the calf. Whereas I claim that a large number of infants will

refuse to be thus modified and die before they will submit, although undoubtedly many infants can do so.

It is not very difficult by calorimetric and metabolism experiments to calculate the caloric value of the food which must be supplied to any particular living organism, be it animal, man or child, to enable it to perform the necessary functions of life which include growth, maintenance, heat and energy production, secretion and excretion. These calculations have been repeatedly made in the case of infants by Rubner and other physiologists; and although I doubt the accuracy of their results, chiefly because they have not sufficiently taken into account the determining factors of external temperatures, clothing, muscular movements, and metabolic habits and so on, yet none the less I think we can approximately estimate the food requirements in terms of calorics and on a basis of weight and age.

Thus we know approximately that, taking an average baby 3 months of age and 10 pounds in weight, the requirements for the 24 hours will be an amount of food which yields 495 calorics. This calculation is made on the basis that about 94 calorics are required for every kilogram of body weight.

The question now arises, is it of importance from the point of view of the specific physiological make-up of the infant in what manner this food is presented? Does it matter, for instance, whether we supply food yielding this number of calorics in the form of pure protein, pure carbohydrate, or pure fat? Common sense tells us that since the food has to supply the material for growth as well as for energy and heat production; the food must at least contain some protein elements. We know further

that fat which has a high caloric value is well suited to the purposes of heat production, and experience tells us that carbohydrates are well suited for the production of kinetic energy. We therefore on "a priori" grounds must conclude that apart from other reasons a mixed diet of proteins, carbohydrates and fats would be a better diet for a growing baby than one consisting of any one of the proximate principles without the others, or in double combination. Having made this admission let us next enquire whether any special combination arranged in any particular proportion would be better than any other.

One must suppose that as the result of millions of years of experimentation Nature has provided each variety of mammal with the combination of these elements in its own milk which is best suited to the physiological make-up of its own particular young. The milk of the dolphin contains 47% of fat as compared with about 3.5% in human milk, because to maintain bodily heat of a young animal swimming about in icy cold water a large quantity of food with a high caloric value is required. The milk of the rabbit contains 10% protein as compared with 1.5% in human milk because the young rabbit grows extremely rapidly and requires a considerable quantity of a nitrogen-yielding food for this purpose. And so on through the whole series of mammals. In human milk the proteins, the fats and the sugars are in the proportion of 1.5, 4, and 6.5 respectively because this combination is best adapted to the physiological "make-up" of the infant; namely to its functions of digestion, absorption, metabolism, secretion, etc., as well as to the conditions of the temperature to which it is normally exposed, and to its habits of muscular exercise and all

those events which make up the sum total of its daily experiences. In cow's milk the proportions are 4, 3.5 and 4.5 respectively. In this connection I would point out that Dr. Vining's figures with regard to the relative proportions of the various elements, protein, fats and carbohydrates in cow's milk and human milk respectively are incorrect. He says the difference between the amount of lactose in the two varieties is only 10%. I should say, making full allowance for discrepancies between different analyses, that 25% was nearer the truth. As regards the protein, made up of caseinogen and the lactalbumens, he says the difference is something less than 10%; if he had said 100% to 150% he would have been nearer the mark. On the basis of this reputed similarity in the chemical make-up of the two milks he disposes of the central argument against the substitution of the one milk for the other in infant feeding.

If therefore we wish to adapt the food to the physiological requirements, in feeding our 3 months old baby we should supply the food which is to yield the 495 calories in a form which contains the proteins, the fats and the carbohydrates in the proportion of 1.5, 4, 6.5. In other words we should give:

- .375 ozs. of caseinogen
- 1. oz. of fat
- 1.6 ozs. of sugar.

It is not, however, enough that the food supplied should be compounded of the above elements and in the above proportions. It is requisite also that these elements should be presented in a form capable of being digested and tolerated by the stomach and intestines. And this brings me to the question of dilution. I do not think it is possible to exaggerate the importance of the

size or bulk of the individual feeds given to young infants. I believe, figuratively speaking, that infants are often drowned in the excess of water with which the food elements are diluted, and that in the limited quantity of water which the "whole-milk" method implies, is to be discovered the secret of its success. We have become so accustomed to think and to speak in terms of percentages as far as the protein, fat and carbohydrate elements are concerned that we are apt to forget about the total quantity or the amount of water. As long as these main food elements are supplied in quantities which correspond with the physiological requirements of nutrition it is a matter of very little importance from the nutritional point of view with how much or how little water they are supplied. From the point of view, however, of the behaviour of the stomach or intestines the degree of dilution may make all the difference. For instance, I often find that infants, in whom the motor functions of the stomach are disorganized, and this, by the bye, is a very common condition as may be proved by the bismuth meal and the x-ray screen, will tolerate small quantities of food in very concentrated form, although when the same food elements are given with a large amount of water they may meet with the greatest resentment.

In certain cases I have given condensed milk in its pure state, without any water at all, with the most excellent results, and in others I have with equally satisfactory results employed dried milk diluted with half the amount of water necessary to restore it to its original strength. I do not believe for one moment that the fat and sugar dyspepsias which are so common in infancy are due to excessive "percentages" of cream or soluble carbohydrates. These dyspep-

sias occur because the "total amount" of these elements supplied in the 24 hours or any other unit of time is more than the organism can accommodate. Nor do I believe that caseinogen even when given in very high percentages, provided it does not coagulate in a heavy clot, is necessarily calculated to cause any disturbance of digestion, unless, indeed, the total amount exceeds the limits of the nutritional requirements. I have on many occasions given sanatogen or its equivalent (caseinogen and glycerophosphate of calcium) as well as whey proteids, casumen and other forms of casein in 5, 6 or 7 per cent. strength without any disturbances of digestion; but a daily total of casein, of fat or even of dried whey powder given in excess for any long continued period of time is quite certain to result in the break-down of the digestive functions at that particular point in the chain of digestive processes which happens to be the weakest or on which the incidence of the injury most acutely falls. I regard these dyspeptic phenomena as manifestations of the calling into play of protective mechanisms. It is the duty of the physician to interpret the meaning of these so-called pathological manifestations and to modify the food in accordance with his findings, and I cannot believe that he can acquire the necessary experiences to do so correctly if his practice is confined to one method of feeding, nor that it is possible to find the antidote to the evils he discovers unless he has a large number of resources at his command.

The method of "percentage feeding" has been subjected to much adverse criticism, chiefly by people who have not understood the significance of the term. Without it, however, it is impossible to write out with any degree of accuracy the formulary for

the preparation of any food or milk mixture so as to comply with any quantitative or qualitative requirements. With familiarity in its use it is quite easy to point out the weak spot of any mixture no matter of what constituents it may be compounded, and to correct the error. On a percentage basis it is little more difficult to employ the top-milk method than to prepare a milk mixture of any required percentage composition by combination of milk, cream, sugar and water, or by combination of pure casein, butter fat, lactose salts, etc. But it is almost impossible for a physician who confines himself to one method, let us say the "citrated-whole-milk" method, to criticize the weaknesses of methods which have failed in particular instances. I do not think that those to whom the limits of dietetic treatment are circumscribed by the restrictions of a single method are likely to possess the resourcefulness which is so requisite for solving difficult feeding problems.

With respect to the choice of the protein element which should be supplied to infants, it is important that we should remember the recent work of Emil Fischer concerning the chemical constitution of the various bodily tissues for the development of which in the growing infant building material must be provided. It has been shown by this investigator that each tissue has its own specific make-up, and that for its development certain definite bricks or kinds of building material are required, and in a definite proportion. These bricks are amino-acids (peptides) or chains of amino-acids (poly-peptides) grouped together in ester combinations or piperazine rings. Can these bricks be obtained equally well from all varieties of proteins? No, certainly not. For instance, the human baby would find it exceedingly difficult or impossible to obtain all the bricks

necessary for building purposes from a vegetable protein. The protein which when broken down into separate bricks by the processes of digestion best fulfills the required conditions is the protein, or proteins, contained in its mother's milk. The protein of cows' milk also contains the required elements but probably not in so economical a form. If mixed proteins are given it is improbable that any required kind or shape of brick will be absent, but some may be present in unnecessary excess and cause trouble from this cause. Problems in connection with this side of development are numerous and not difficult.

Then again there are other problems associated with the presence in the food of certain indefinite bodies which have an influence on nutrition totally out of proportion to their bulk, and which for want of a better name have been called vitamines. These bodies, whatever be their function, appear to be essential to good nutrition, and if not present in the routine dietary must be supplied independently in some other form.

These and many other points of difficulty arise in connection with the feeding of infants, but it is a great mistake to imagine that these dietetic problems can be settled by formula. It has indeed been suggested that competent authorities should formulate a standard dietary for the feeding of infants which should be universally employed irrespective of the individual idiosyncrasies of the child. The Association of Infant Welfare and Maternity Centers is bombarded with such requests. This Association to which some 300 local centers are affiliated and which may be considered to be their mouthpiece and central authority has constantly refused to draw up any such formulæry, for its executive committee has

acted on the principle that the main use of infant consultation centers is to afford expert assistance in cases in which the feeding requires individual adaptation. As long as infants refuse to conform to standard it is impossible to standardize their food. There can be no master antidote for, or universal prophylactic against, one and every variety of digestive, assimilative, metabolic, secretory and excretory defect which is liable to occur in infants, and which is very largely dependent on the personal index. For this reason I do not believe that there can be such a thing as a "best" food for infants; the best food for each individual infant is that which is best adapted to its general physiological make-up, and it will be different in each case. If expert advice can not be procured to decide what is the "best" food for any particular case, it may be necessary to fall back upon some food which practical experience shows is likely to do least injury in the largest number of cases, and which is easy and simple to use. With the multiplication of infant consultation centers, these cases are likely to become fewer and fewer. I think, however, it would be a most retrogressive step to concentrate on such hypothetical cases, and far better to devote our energies to the spread of a better knowledge. Dr. Vining says: "few of us have time or patience to wade through this multitude of detail"—i. e. the detail necessary for understanding the quantitative compounding of the food. For my part I think that the importance of the subject justifies the expenditure of just as much time and patience as may be required to acquire the necessary degree of knowledge. If those to whom the public and, in certain cases the profession, look for light and guidance in these matters, say that the details of accurate modification are too difficult to un-

derstand, it is quite certain that the control and management of infant feeding will pass out of the hands of medical men into those of nurses and health visitors, many of whom are now making a serious study of the subject, and who have both the time and the patience to master the details.

In connection with the use of dried milk, Dr. Vining says: "It is a pity the profession should have given the dried milk so much support," and he proceeds to found his objections to its use on the grounds of bacterial contamination. It is quite true that the best brands of dried milk and the ones which most closely resemble fresh milk are not bacteria-free, (some brands are quite germ-free, an advantage often gained at the expense of other qualities) but even in this respect they have the advantage of dairy milk of the best quality obtainable. Very few certified milks, however carefully handled, contain a lower bacterial count than 8,000 bacteria per c. c. and such milk must necessarily be expensive. An average sample of dried milk, desiccated by the most scientific method, i. e. by the Bévenot-de-Neveu process, contains from 4,000 to 10,000 bacteria per gramme weight. In other words, when reconstituted with water it will only contain from 800 to 1,200 bacteria per c. c. Judged on the criterion of bacterial impurity, certified dairy milk is eight times as impure as an average sample of dried milk. If Dr. Vining has any doubts about the safety of giving such a dried milk to a young infant, there is absolutely no reason why it should not be boiled or scalded in the same way that dairy milk can be boiled or scalded before it is administered to the infant. I think, however, that if Dr. Vining will read Dr. S. Delépine's report to the Local Government

Board upon "the effects of certain condensing and drying processes used in the preservation of milk upon its bacterial contents" (Food Reports, No. 21, 1914) he will have no further anxieties on this score.

I have had a very wide experience in the use of dried milks in the feeding of infants and I can safely say that they give very good results, when used with discrimination. But the same objection holds to their use when diluted with water as holds in the case of "whole milk." If dried milk is reconstituted with 8 parts of water we return to the condition of whole milk; and if we attempt to feed an infant on such a food, we presuppose that its digestive, assimilative, metabolic and excretory functions are the same as those of a calf. To use dried milk to the best advantage it must be modified to the special requirements of each infant or to the standard of human milk, in the same way that it is necessary to modify dairy milk.

The conclusions then at which I arrive are, *firstly*, that the "citrated-whole-milk" method is physiologically unsound, because it allows no latitude for adaptation to the digestive, assimilative, metabolic and secretory activities of the individual baby and that its use implies obligatory modification on the part of the infant. *Secondly*, that it affords little scope for the study of the influence of variations in the diet. *Thirdly*, that if the principles of percentage feeding are understood synthetic foods can be prepared in a great variety of ways to satisfy the physiological requirements of particular babies, and *fourthly*, that dried milk if properly modified has all the advantages and few of the disadvantages, on the score of expense or on other grounds, of so-called dairy milk.

## MEDICAL PROVISIONS IN WORK-MEN'S COMPENSATION LAW.

BY

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It has come to be believed that the cost of industrial accidents—medical attention, loss of wages from disability, etc.—should be borne by industry as a part of the cost of production, and that this can best be provided for by some form of insurance. The cost of this insurance varies according to the hazard in each industry. In the old method of damage suits against the employer, known as Employers' Liability, it was necessary to prove negligence and this usually resulted in long and expensive litigation with uncertain results. The remedy for this is found in workmen's compensation laws, which seek to provide an economic adjustment in the relationship of employer and employee. The intention of such a law is to grant certain and prompt relief of definite amount without the necessity of proving negligence. In most states where such a law has been enacted it has been made compulsory.

All compensation laws have, or should have, certain underlying fundamental objects. Among these is to provide for medical and surgical care for injured employees, the object being to reduce the period of disability. Including Alaska and Hawaii, thirty-three states and territories have enacted workmen's compensation laws. These laws are in many particulars similar, in others widely different. This is illustrated by the provisions for medical and surgical aid outlined below. The laws of Alaska and Arizona are unique in providing for the payment of the physician only in the case the patient dies.

*Alaska.*—Only in case of death and no dependents, maximum \$150.

*Arizona.*—Only in case of death. Medical expenses paid by estate.

*California.*—Provides for medical, hospital and supplies for 90 days, Comm. may extend time.

*Colorado.*—Medical, hospital and supplies, 30 days, maximum \$100; in case of hernia, if operation, special fee, maximum \$50.

*Connecticut.*—Medical, hospital, limited to prevailing charges; employee may provide and pay for same; special provision for seamen.

*Hawaii.*—Medical, hospital and supplies, maximum \$50; limited to prevailing charges for like standard of living.

*Illinois.*—Medical, hospital, limited to 8 weeks \$200. Own physician, own expense.

*Indiana.*—Medical, hospital and supplies, 30 days. Additional time may be ordered by Industrial Board; refusal suspends.

*Iowa.*—Medical, hospital and supplies, on request; maximum 14 days, \$100.

*Kansas.*—No provision; must submit to medical examination on request; \$1 for certificate.

*Louisiana.*—Medical, hospital; maximum \$100, 14 days.

*Maine.*—Medical, hospital and medicines; maximum \$30 unless major surgical operation; amount fixed by commission.

*Maryland.*—Medical, hospital and supplies; maximum \$150; charges like standard of living as prevail in same community.

*Massachusetts.*—Medical, hospital and medicines, 14 days; longer at discretion of board.

*Michigan.*—Medical, hospital and medicines, first three weeks.

*Minnesota.*—Medical, supplies, maximum 90 days, \$100; court may increase to \$200.

*Montana.*—Medical, hospital and medicines; maximum \$50; hospital contracts subject to regulation by board.

*Nebraska.*—Medical, hospital and medicines; maximum \$200, 21 days.

*Nevada.*—Medical, hospital; maximum 4 months; to equalize cost employers may effect mutual arrangement for treatment and deduct \$1 per month from employee's wages.

*New Hampshire.*—Only in case of death, employer pays medical attendance, maximum \$100.

*New Jersey.*—Medical, hospital and medicine; maximum \$50, 2 weeks.

*New York.*—Medical, hospital and supplies as requested by employee; maximum 60 days; charges limited to prevailing rates like standard of living.

*Ohio.*—State Insurance Fund, pays medical, nurse, hospital and medicine; maximum \$200.

*Oklahoma.*—Medical, hospital, nurse, supplies, 15 days; charges limited prevailing rates like standard of living.

*Oregon.*—Transportation, medical hospital; maximum \$250, no time limit.

*Pennsylvania.*—Medical, hospital, medicine and supplies; 14 days, \$25; for major surgical operation maximum \$75; refusal to accept forfeits compensation.

*Rhode Island.*—Medical, hospital and medicines, 2 weeks; failure to agree on amount of charge, price fixed by court.

*Texas.*—Medical, paid by Association, 1 week.

*Vermont.*—Medical, hospital and supplies; maximum \$75; limited to prevailing rates for like standard of living.

*Washington.*—No provision for medical and surgical aid; provision for medical examination upon request.

*West Virginia.*—State Fund pays medical, hospital to \$150; certain cases, \$300; special regulations for hernia.

*Wisconsin.*—Medical aid, crutches and apparatus during disability; maximum 90 days, Commission passes upon reasonableness of bills.

*Wyoming.*—No provision as to who pays; payments to employee not made until discharged by physician; refusal to submit to treatment forfeits compensation.

It should be our endeavor to obtain uniformity in these laws. There seems to be no reason why people should be treated differently in different communities. Medical care shortens the period of disability and may prevent permanent injury. In my opinion reasonable medical and surgical care and nursing and hospital supplies should be furnished by the industry while disability lasts. Under no circumstances should the law limit the employers' liability for such services, except that the charges be reason-

able. No other conclusion can be defended on either humane or financial grounds. Anything which would prevent a complete cure or prevent the best medical attention tends to defeat the very object of the law itself. In other words, there should be no limit in time except the reasonableness of the charge in the discretion of the court. The price paid should accord with the rates prevailing in the community.

There are, however, other reasons for not limiting costs of services. It is usually stated that a definite fee bill must be fixed in order to compute the cost of insurance. The present premiums collected in this state, far more than pay the cost of any medical service. The rates under State Insurance Fund, being lower than those of any insurance company. In this fund, 28 per cent. was allowed for medical services, hospital, nursing and appliances. Less than half of this has been paid for such services, so it seems that either more money should be paid to physicians or else the premium rates on insurance should be reduced. There has been no hardship in the amount of premium collected by the state, and these rates are less than those of any company, and it would appear that a dividend has been created at the expense of the physicians and surgeons throughout the state who have attended compensation cases. In my opinion, the amount collected at the present time can pay all reasonable fees by physicians without limit, even though in some cases medical care be continued through life.

There is still a further reason and quite as potent to my mind. The burden in the past of serious accidents in industry has not been borne exclusively by the employee. For years injured employees in industrial establishments have been for a large part cared for in hospitals, or at clinics, or in

physicians' offices, these latter have oftentimes received little or nothing for their services. The care at hospitals and clinics has been a charge upon the community or upon the philanthropic people who have supported such institutions, and upon the physicians who have attended these places. There is, to my mind, no reason why these institutions should be supported wholly by the hazardous method of philanthropic contribution. If industry sends these cases to the hospital, they should be paid for by industry, and the physicians who attend these cases in the hospitals should likewise be paid for their services by industry. Why should physicians be called upon to donate their services to an industry?

Let the cost of injuries go into the price of any commodity. If there is a waste of human life in the production of any commodity, let the price of that commodity be increased to cover it even though it may reduce or even eliminate its use. In this city many of our hospitals are supported by public taxation, and other hospitals of semi-private nature receive public moneys. When there is a severe accident in industry the patient is removed to one of these hospitals. It is unfair and unjust that the treatment for such an injury should come out of the pockets of the public. It should be paid for by the kind of industry that caused the accident. The burden of taxation is already heavy, and must in some way be reduced in the future.

Still further, a very large percentage of the injuries now received become compensable because of infection in the wound. The records of some of the largest steel companies in the United States show that such results are practically unnecessary. Thus, with competent physicians and with every facility in the way of first aid hospi-

tals, the Carnegie Steel Company, the Youngstown Sheet and Tube, and the Cambria Steel Company, which I cite as examples, have reduced their infected cases from about 50 per cent. to about one-tenth of 1 per cent. Since the law holds the employer responsible for compensation during disability, beyond a waiting period, it is to his interest to terminate the case, if possible, before the end of that period, particularly so, as infected wounds are likely to produce permanent partial disability. The importance of prompt and competent medical attention in such cases can hardly be over-estimated. The best medical aid pays a big dividend in certainty and rapidity of recovery.

The question, however, arises, shall the injured employee be allowed to secure treatment by a doctor of his own selection, paid for by the employer. In the majority of cases my own experience leads me to believe that such a condition is not best for the employee under ordinary circumstances. Many employees are ignorant of the language of the country and, knowing little of what may happen to the wound, neglect the case or secure someone who is not competent. It is an unfortunate fact which must be admitted by the medical profession, that there are many practicing physicians who should never have been permitted to enter the medical profession, and not infrequently such a one is employed when the employee selects the physician. On the other hand I have seen many selected by employers who were careless, arrogant and probably just as incompetent as those selected by the employee. We must recollect that in the selection of a physician confidence is part of the battle and the employee must have confidence in the physician who attends him. In the majority of states it

is compulsory upon the employee to accept the physician that the employer chooses to send. As an instance of incompetence on the part of such physicians, I could cite many cases, but two of the same character are sufficient. In both of these cases the employee under the care of the employer's physician had been ordered to return to work. Their injuries were of the same character. Each was a fracture of the fibula, the bones not in apposition and the fracture not recognized by the physicians. In another case a patient had worn a splint for seven weeks for fracture of the metacarpal bone, the physician having been engaged by the employee, and an x-ray of the hand showed that no fracture had ever existed.

*Malingering.*—During my term of service as commissioner I was surprised to find the number of malingers so small. True, in the beginning there are fewer of this class than there would naturally be later on. It is impossible not to find a certain number of malingerers. To prevent this there must be absolute cooperation with the medical profession. If there are dishonest practitioners the evil is bound to grow. Malingering, however, must be differentiated from hysteria due to strain or hypochondriacal conditions for any reason. During the fore part of the year, when there was little or no work for certain classes in the city, as for instance, longshoremen, those who were injured in the summer before the European war commenced, or in the early fall, having no work to return to, and depressed by the conditions showed greater length of disability.

The responsibility for the detection of malingering rests principally with the medical profession.

The average cost for medical attention

per case varies greatly. In Ohio, \$9; in Michigan, \$2.11; in New Jersey, \$2.79; in Illinois, \$5.90, etc. This average is, of course, of no value in computing the proper rate of the compensation.

*Hernia.*—One of the difficulties experienced in the administration of most compensation laws is the adjustment for disability resulting from hernia. Hernia resulting from the strain of lifting or other accidental cause is undoubtedly compensable. But because of the difficulties of diagnosis experienced, such as increase of an old hernia, it would be well that every law contain certain rules in regard to these cases. Two states have enacted such laws, Colorado and West Virginia. The law in Colorado is as follows:

"A workman in order to be entitled to compensation for hernia must clearly prove: (1) That the hernia is of recent origin, (2) That its appearance was accompanied by pain, (3) that it was immediately preceded by some accidental strain suffered in the course of the employment, and (4) that it did not exist prior to the date of the alleged injury. If a workman, after establishing his right to compensation for hernia as above provided, elects to be operated upon, a special operating fee of not to exceed fifty dollars shall be paid by the employer, the insurer, or the commission, as the case may be. In case such workman elects not to be operated upon, and the hernia becomes strangulated in the future, the results from such strangulation will not be compensated."

In West Virginia it must be proven:

*First.*—That there was an injury resulting in hernia.

*Second.*—That the hernia appeared suddenly.

*Third.*—That it was accompanied by pain.

*Fourth.*—That the hernia immediately followed an injury.

*Fifth.*—That the hernia did not exist prior to the injury for which compensation is claimed.

It also states that the hernia *shall* be treated in a surgical manner, and in case the injured employee refuses to undergo the radical operation no compensation will be allowed during the time such refusal continues. If death results from such operation, the death shall be considered as the result of the injury. The cost of the operation should be paid for by the employer.

*Apoplexy.*—Perhaps a more important subject to be considered is the question of diagnosis in case of sudden death. Of the hundreds of thousands of workers there must, of necessity, be a certain number that will die in the ordinary course of events during working hours. During last year I saw a number of such cases. In the majority of these cases the death certificate stated that death was due to apoplexy and yet in all of these cases there were no symptoms of paralysis and death was instantaneous. The history of such cases was usually that a man was standing up, still, or walking and that he was seen to fall. Many stated that they thought he had slipped and struck his head, alleging that the workman was dizzy and fell, striking his head, thus producing a hemorrhage and apoplexy. To my mind every one of these cases was death from heart disease. Those who are familiar with apoplexy know that fully one-half of the cases recover and that of those who die it is a question of hours, days, or even weeks. I have, in my own experience, seen but one sudden death due to apoplexy, and that was due to a hemor-

rhage into the fourth ventricle. The record of pathologists shows that nearly every case of sudden death not due to violence is due to heart failure. In order to remedy any mistakes of diagnosis every compensation law should contain some provision relative to *post-mortem* examinations. At present there is but one state that provides for autopsy, and that is Indiana (sec. 8).

*Septicemia.*—In the compensable cases examined by the Compensation Commission of New York during the first six months, over 17 per cent. were due to infection. A part of these were due to the lack of attention on the part of the employee to trivial injuries such as slight puncture-wounds of the fingers; others were due to lack of immediate care which should have been furnished by the employer; still others were due to carelessness or incompetence on the part of the physician.

If the wound happened to be upon the little finger but little care was given to it, evidently because the payment for disability of that finger amounted to much less than for the other fingers. Every surgeon knows that wounds of the thumb and little finger are far more to be dreaded if they become infected than those of the other fingers because of the greater possibility of infection of the palm of the hand. In various cases which appeared before me many physicians failed to appreciate the danger of such infection and apparently did not know the channels through which such infection might take place. Infection of this character often totally destroys the use of a hand, or very nearly so, and in doing so may produce permanent vocational disability.

Arising out of this partial destruction of a member comes another question. The

law speaks not only of the loss of the hand and gives a definite amount for such loss, but also the loss of the use of a hand. As to what constitutes such a condition and many other similar defects, there may be many honest differences of opinion in the profession. And it seems to me we should have more of a standardization of defects. I was particularly struck with this difference of opinion in the profession when, as Commission of Health, we began the physical examination of children in the public schools, and tabulated the defects, the first examination covering three hundred and forty-eight thousand children. A physician sent to one school found among the children thirty-three per cent. with physical defects. In order to check this work another physician was sent to the same school and he found that ninety-five per cent. had physical defects. The difference was in the mind of the physician. In other words, what is the normal size of a tonsil? What constitutes defective eye-sight? and what, in a compensation law, constitutes the loss of use of a hand? If the thumb and the palm are still left, is that the loss of a hand? If it is, does it not put a premium upon major operations?

So, also, another question arises along this same line, what is the length of disability? Does disability continue to exist although the wound be healed? The length of disability must ever vary according to sex, age, general physical condition and race. The question constantly arises, is the claimant able to return to work, being apparently cured? Further, will a return to the same employment result in a renewed or continued disability? These are practical questions which arise day after day in the consideration of such claims.

## FACTS ABOUT MORPHINISM.

BY

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This paper was read by invitation before the American Society for the Study of Narcotic Drugs, at its meeting in Philadelphia, 1913. At that time the passage and enforcement of the present anti-narcotic laws had not made the consideration of narcotic drug addiction a matter of as urgent importance to the medical profession as it is today. In view of the problems for immediate handling which the enforcement of the narcotic drug laws has placed upon the medical profession, it is apparent that the material contained in this paper is even more timely in the present crisis than it was when it was written.

The handling of our problem of the narcotic addict must be based upon an understanding of the addict and of his real condition, of which all too little is generally known. The sufferer from narcotic drug disease, and the physician who is treating him, are in a position today in which the appreciation of all the facts that can be brought to bear are of even more importance than they were at the time this paper was prepared. This paper is submitted practically as it was read with but slight revision.

### PAPER.

I am writing this paper as an internist, a medical practitioner, who has no specific routine treatment to advance, no special

method to advocate, and who is associated with no "drug hospital" or "drug institution" which reaps any pecuniary recompense from the treatment of drug cases. Aside from my directing of treatment in the narcotic drug wards of the Workhouse Hospital my work in narcotic drug conditions is purely as they come to me in the course of my medical practice, and interests me simply as these conditions represent interesting disease problems among other morbid body processes. I do not desire to be labelled "specialist" in their treatment nor to confine my work to the care of those so afflicted.

It was my lot for a time to have care of those admitted to the alcoholic and prison wards of Bellevue Hospital—among them many morphinists. When I undertook this work I was ignorant of facts and devoid of previous experience with such cases except as they had come into the general wards for other treatment. Biased by the commonly accepted and widely taught doctrines, I attempted futilely along conventional lines to utilize the information and instruction I found available.

Struck by clinical facts which did not accord with past teaching, I forgot my books and turned a deaf ear to authorities and immediate influences. I tried to seek out from my personal study and observation of the individual case data upon which to form theories which would accord with clinical facts and with verified histories and, if possible, give a basis of help to these unfortunates.

Since then I have gradually gotten together, and with some success attempted to interpret and explain and apply, what seemed to me facts about morphinism. To my mind and in my experience these facts offer a beacon-light of hope and assure ultimate

rescue of the majority of the so-called "incurable dope fiends."

To begin with, I consider it a fact that a majority of morphine users have been terribly wronged in a firmly rooted and widespread opinion prevalent among both medical men and the laity. This is that chronic morphinism is a morbid habit; a perverted appetite; a vice; that only he who is mentally or morally defective would allow it to get a hold upon him; and that its main and characterizing manifestations are those of mental, physical and moral degeneration. Morphine addicts are supposed to have irrevocably lost their self-respect, their moral natures and their physical stamina. They are painted as liars, full of deceit and absolutely untrustworthy—who use a dream and delight producing drug for the sensuous enjoyment it gives them, and who do not want to discontinue its use. They are thought of as physical, mental and moral cowards who, after realizing their deplorable condition, refuse to exert will power in the endurance of discomfort as the price of freedom.

This was my opinion when I began work in the alcoholic and prison wards of Bellevue Hospital. On this hypothesis, fortified and directed by the available literature and by the teachings of those in my immediate reach, I treated the patients for a considerable time with results which superficially seemed to corroborate both literature and teaching. Those who did not die managed to get their drugs and relapsed, or left the institution uncured with but an exceedingly discouraging small number of possible exceptions.

From my patients themselves, and from watching and studying them, I later learned the truth, which has since been continually strengthened—that the so-called discom-

forts we think of them as suffering upon withdrawal of their drugs are actually unbearable torment, accompanied by physical manifestations sufficient to prove this to be so. I also learned that the delightful sensations which have formed the background for all pictures painted of them, had in many, if not in most, of the cases with which I came in contact never been experienced. If they had ever existed they had long ago been lost and all that remained in morphine effect was support and balance to organic processes necessary to the continuance of life and activity. As I have written elsewhere, these sensations seem to be "part of the minor toxic action of the drug, against which the addict is nearly or completely immune, and to the securing of which very many and probably a majority of the innocent or accidental addicts have never carried their dosage." In plain English the sufferer from morphinism has, in many if not the majority of cases, never experienced any enjoyment as a result of the drug and has endured indescribable agony in its non-supply.

I do not mean to say that morphine will not produce pleasant sensations, or that it is never used to the end of experiencing these sensations. There is a class of the inherently, or otherwise defective or degenerate, who first indulge in opium or its products from a morbid desire for sensuous pleasures, just as they would and do indulge in any form of perversion. They are mentally incapable of self-restraint, indulging jaded appetite with new stimuli. They yield themselves to any and all forms of self-indulgence and gratification of appetite. There comes a time when for them opiates, from increasing tolerance and dependence, lose power to give pleasurable sensations and become simply a part of

their daily sustenance, exacting physical agony for its non-administration. When this occurs they make no effort to control its amount, or method, or use; and it with other conditions attendant upon their mode of life soon relieves society of the menace of their membership. As a class they have been regarded as incurable and hopeless—socially, economically and personally unworthy of salvage. To whatever extent this may be true, however, it is not true because they happen to have acquired morphinism, but because they are fundamentally what they are—diseased, degenerate and defective. The morphine element is as incidental to their fundamental condition as are the venereal and other diseases from which many of them suffer. Many of this class of addicts fall into the hands of the charity hospital alienist and the penitentiary physician. The observations and conclusions of such doctors have had an unwarranted influence in the status of morphinism and the classification of the morphinist. Because this degenerate class began to use opium or its products to secure sensuous gratification is no reason for stigmatizing the mass of those afflicted with morphinism as people of perverted appetite. No one should study morphinism in them unless he is possessed of sufficient ability in clinical observation to separate physical signs of morphinism from the manifestations of defective mentality—unless he has enough insight and breadth of vision to see behind end results, primary causative factors; and unless he has enough common sense to refrain from applying to the worthy many the observations he has made upon the unworthy few.

There are some above this class, of the type of spoiled and idle youth, who indulge first in opiates in a spirit of bravado or of curiosity. There are some who first used

morphine to temporarily boost them over an emergency. [The majority of morphinists, however, present a very different history. Mentally and morally they are of the same average equipment as other people. They form a class which might be called "accidental or innocent" morphinists.] They had no voice or conscious part in the early administration of morphine, realizing no desire for it by name, but only wishing for the unknown medicine which relieved their sufferings. Many of my patients have received their first knowledge of morphine administration in the withdrawal symptoms which followed the attempted discontinuance of its use. There is in these sufferers no element of lack of will power; no trace of desire to indulge appetite or to pander to sensuous gratification. In some, before their condition was recognized, their tolerance for or dependence upon morphine had proceeded to a point where their bodies' demand for morphine was imperative and their withdrawal agonies unendurable. In others, before body need was completely established—with their stamina and nervous resistance below par from sickness and suffering—they have been unable to forego morphine's comfort giving and sedative action, or to endure the nervous and other symptoms attendant upon its withdrawal after a brief period of administration.

Unfortunately very few physicians have had adequate experience with or instruction in the symptomatology of morphine need; and these symptoms exist for some time undetected or attributed to the complaint from which the patient originally suffered. By the time the truth is realized and the origin of the symptomatology appreciated, the disease is often too far advanced to place it within the physical endurance of the average man to summarily discontinue morphine

usage. The victim then tries gradual reduction—as a rule incompetently handled—and relapses. He turns with decreasing hope to advertised "cure" after "cure" and finally either gives up the struggle in despair and is forced to a lower personal, social and economic plane, or learns to so regulate his drug use and life as to live a fairly competent existence.

It cannot be denied that many morphinists show physical deterioration and mental and nervous impairment, and that they will lie and steal if necessary to get morphine. We have regarded these manifestations as a direct result of morphine use and have called them the stigmata of the morphine user. This is unjust and untrue. These manifestations are not intrinsic to morphinism nor are they a necessary part of its symptom complex. They are, when they occur, incidental to morphinism and alien to its fundamental mechanism as I conceive it to be. As I have written in a previous paper,<sup>1</sup> bodily and mental deterioration in a morphinist is a result of inhibition of function, autointoxication and malnutrition, exhaustion, worry, anxiety and fear. These may follow morphine dosage below or in excess of the amount required by the patient's body to satisfy the demands of his changed physiology. Deterioration varies with the extent of malnutrition, anxiety, poor eliminative function, and autointoxication, exactly as it does in any other toxic state. Its manifestations are, in a word, complications resulting from bad management of the case, as complications often are in other diseases. They are not different from the functional and nervous incompetence and the physical and mental impairment which so often complicates cardiac or

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<sup>1</sup> Narcotic addiction, a systemic disease condition. *Jour. A. M. A.*, 1913, Vol. LX., p. 431.

renal disease, arteriosclerosis and many other conditions. We have as much reason to class all sufferers from heart, kidney and arterial disease as degenerates as we have to so stigmatize all morphinists. It is just as reasonable to expect a patient to cure his heart disease by the exercise of will power as it is to ask the well developed case of morphinism to overcome his disease by the same means.

In addition to the physical effects of chronic poisoning with the toxins of inhibited metabolism and autointoxication causing deterioration, the attitude of society itself, medical and lay, forces upon the morphinist conditions and environment which are responsible for much of his apparent mental and ethical alteration. He has become absolutely, physically dependent upon morphine for the maintaining of life and activity and economic efficiency. Legally or illegally he must get his drug. Not to get it means physical torment, collapse and revelation of his condition, and his being branded as a hopeless social outcast. Getting it means constant vigilance, worry and fear of detection with more or less physical and mental inefficiency depending upon the patient's ability to learn to regulate his drug and life. It is not to be wondered if under these conditions he resorts to every possible means to hide his affliction and grows increasingly expert in deceit as he becomes more practiced in the necessary avoidance of self-revelation. He knows that for him there will not be much of pity; not much of sympathy—practically no hope of understanding help. He knows that if he fails to maintain the semblance of normality, and the cause of his condition is discovered he will be shunned and distrusted by his associates and friends and a cause of shame to his family. He must keep his secret to

hold the respect of his associates. [He must get sufficient morphine to maintain enough normality to keep his secret. At any time he may fall ill from some incidental illness or some accident may deprive him of his drug for a time long enough to make his condition known. He looks forward to the day which will probably sometime come when half poisoned, half starved and wholly miserable, he becomes from long standing autointoxication and increasing weakness actually mentally incompetent—a despised and hopeless incurable in the mind of the internist; an end result for the sermonizing of the moralist and the study of the alienist. Few of us would remain in mental and nervous balance under such suffering and strain. We would go to any length to get the drug of our need and we would protect at any cost the secret of our affliction.

As to the existing opinion that the morphinist does not want to be cured and that while under treatment he cannot be trusted and will not cooperate—but will secretly secure and use his drug—I can only quote from my personal experience with these cases. During my early attempts with the usual methods of sudden deprivation, gradual reduction, etc., and later with the so-called Towns or Towns-Lambert treatment, my patients beginning with the best intentions in the world, often tried to beg, steal or get in any possible way the drug of their addiction. Like others, I placed the blame on weakness of will and lack of determination to get rid of their malady. Later I realized the fact that the blame rested almost entirely upon the shoulders of my medical inefficiency and my lack of understanding and ability to observe and interpret. The morphinist as a rule will co-operate and will suffer if necessary to the limit of his endurance. Demanding co-

operation of a case of morphinism during and following incompetent withdrawal of the drug is asking a man to cooperate for an indefinite period in his own torture. There is a limit to everyone's power of endurance of suffering.

Living examples of what I have written are many morphinists who have maintained for years a personal, social and economic efficiency—their affliction unsuspected. These cases are not widely known but there are a surprising number of them. When one of them is known his success in handling his problem is generally attributed to his being on a rather higher moral and mental plane than his fellow sufferers and possessed of will power sufficient to resist temptation to over-indulge his so-called appetite. We have not considered any other explanation nor sought more at length for the cause of his apparent immunity to the hypothetical morphine stigmata. We would have been wiser to have respectfully listened to his experiences and learned something about his disease. The facts are that instead of being men of unusual stamina and determination, they are men of unusual mental ability. They have tried the various methods of cure without success. They have realized the short-comings and inadequacy of medical understanding and treatment of their condition. Being practical men and making the best of the inevitable they have made careful and competent study of their own cases and have achieved sufficient drug knowledge to keep themselves in functional balance. Their success was not due to determined moderation in the indulgence of a morbid appetite. It was due to their ability to discover facts; to their wisdom in the application of common sense to what they discovered; and to rational procedure in the carrying out of their conclusions. They have simply learn-

ed to manage their disease so as to avoid complications. When I tried to account for some of the things I saw by questioning these men who had studied and learned upon themselves, I got a clearer conception of what morphinism was.

Disposing of the distracting and misleading complications mental and physical, and studying the residue of symptomatology left, we make some very surprising and striking observations. We find that we are dealing fundamentally with a definite condition whose disease manifestations are not in any way dependent upon mental processes, but are absolutely and entirely physical. These symptoms and physical signs are clearly defined, constant, capable of surprisingly accurate estimation, yielding with a sureness almost mathematical in its control to intelligent medication and recognition and appreciation of causative factors; forming a clean-cut symptom-complex peculiar to morphinism. Anyone—whether of lowered nervous, mental and moral stamina, or a giant of mental and physical resistance—will, if morphine is administered in consecutive doses over a sufficient length of time, develop some form of this symptom-complex. It represents causative factors, and definite conditions which are absolutely and entirely due to changed physical processes, which fundamentally underlie all cases of morphinism, and which proceed to full development through well marked stages.

During the past years I have had under my care excellent and competent physicians of unusual mental and nervous balance in whom there could be no hint of lack of courage, nor of deficient will power, nor of desire to be free from their affliction. They with others have cooperated and aided in experiment, study and analysis, and the result has been, in their minds as in mine,

complete confirmation of the facts above stated.

Time is lacking in this paper for a discussion of the fundamentals underlying morphinism. Somewhat of their character, manifestations and principles of action I have already—to the best of my understanding at the time of writing—briefly sketched in previous papers. The matter in my first paper,<sup>1</sup> on "Morphinism and Its Treatment," written several years ago, I would greatly modify and change at present. Some of it dealing with fundamental disease principles and drug action holds true. The portions dealing with details of treatment are, however, in the light of later experience and study, obsolete and misleading. This paper represents a stage of my transition from effort based on "routine" and "method" to my final abandonment of all routine methods for rational therapeutics of known disease. If I had written "Morphine and Its Treatment" a few months later it would have been presented in a different way. It stands as evidence that before adequate understanding and comprehension of disease principles and fundamentals, and realization of their importance and bearing in rational therapeutic application are attained, discussion of detailed treatment is premature and misleading.

As to treatment and hope of cure, I believe that I can truthfully say that in morphinism per se we have what will before many years be recognized as one of the most definite and curable diseases in medicine. Treatment which is based upon the recognition and removal of fundamental conditions as they appear in the individual case will give surprising results. Most of the past treatments have aimed at the withdrawing of morphine and bolstering up by

whatever means were at command, the supposedly defective mentality and will power. I want to emphatically state that the using of morphine does not constitute morphinism, nor does the mere withdrawal of the drug constitute the cure of morphinism. The desire for morphine in the majority of cases is simply the expression of body need, as the desire for water is the expression of body need. The fundamental condition is the changed physiology which makes morphine a necessity for organic satisfaction and adequate carrying on of organic function. If this were not so we would long ago have reached the solution of our problem. Withdrawing of morphine has been accomplished in many ways and the average patient will live through almost any method of so doing. Experience shows, however, that following withdrawal—when withdrawal alone is depended upon to cure—comes months of suffering and endurance of physical inadequacy so great and so constant that there are few who do not relapse.

The mere taking away of morphine from a morphine addict is simply one step in the conduct of that man's case; and it is by no means the most important step. It can be accomplished in a number of ways and its procedure is a matter of selection in the individual case to meet the indications of that case. Once it is started, it should be done as rapidly as possible and without undue suffering and strain. Otherwise its conduct will abort results and the patient will not be relieved of his drug need. In the treatment of a case, of far more importance than any method of morphine withdrawal is the sufficient understanding of the disease mechanism and its symptomatology, and the ability to accurately estimate the patient's bodily need, and the maintaining of him in functional and metabolic addiction-

<sup>1</sup> *Jour. A. M. A.*, 1912, Vol. LVIII, p. 1499.

drug balance, and the securing of good tone and nutrition before withdrawal. This point of view should be maintained to the issue of the case. In the estimation of results following withdrawal of the drug, the mere fact that the patient is no longer taking morphine should be regarded as of very subordinate importance compared with the clinical evidence of his lack of body need for that drug, and his actual physical condition. The stage of withdrawal of morphine in a competently functioning individual who is in metabolic and addiction-drug balance is a matter of assured accomplishment in the vast majority of cases. The essential and all important final condition which must obtain is that the patient must be left free of the physical need for his drug of addiction, and in a condition of functional and metabolic balance which will permit him to react to strain and withstand the stimuli and influences of everyday life without artificial support. In the first paper I wrote on this subject, I laid great stress on this point. This I know can be done and if I were at liberty to do so without harm to them, I could summon the testimony of able physicians—past patients. For its accomplishment I have no "cure," no routine method, no special "treatment" to advance. I know of no drug or combination of drugs which can properly be called a "specific."

Morphinism fundamentally is a disease. It shows stages and variations just as do other diseases. It is complicated by or complicates other diseases exactly as do other morbid body processes; and every case is absolutely individual. It is just as reasonable to treat all cases of pneumonia or typhoid or cardiac disease according to any one method as it is to so treat morphinism. From my experience, I conceive it just as impossible to honestly promise short dura-

tion cure for all cases of morphinism as it would be to do so in any other disease. Rational treatment and prognosis must depend in it, as in other diseases, upon its stage and development; upon its complicating factors; and upon the condition of the patient—mental and physical—in the individual case.

Most of the routine "cures" and "treatments" which have been put forth have been the result of part knowledge, an appreciation and application of a part of the facts applied in a quest for a specific, a panacea, a "Morrison's Pill" to be given to all cases indiscriminately. Most diseases have gone through this stage of therapeutics. It represents a stage in the comprehension of morphinism. My own experience with these "treatments" has been largely with that known as the "Towns treatment." At one stage in my experience, I believed it to be of some use in some cases. To my analysis of what fundamental principles formed its basis in the mind of whoever first evolved it—to my early efforts to explain its hardships and failures—to my early endeavors to formulate from study of actual clinical manifestations, principles of addiction-disease and addiction-drug reaction; in the hope of avoiding these hardships and failures, I owe some of the progress I have made in understanding morphinism to whatever extent I at present do. That it or any other one "treatment" will solve the medical problem of narcotic drug addiction is to my mind impossible. I have found the abandonment of routine and the treatment of addiction-disease as I find it in the individual case less objectionable and more efficacious.

Modern medicine has for some time been getting away from the blind following of routine and the search for specifics, and is aiming at the search for, consideration of,

and treatment of fundamental cause and underlying conditions. When this method of research is applied widely to morphinism and the facilities of our great charity hospitals properly directed to its furtherance, we shall rearrange our conception of morphinism. Restraint and custodial care, and psychiatric classification will be applied more sparingly and more intelligently. Many worthy sick people will, instead of being refused admission, or turned back into the streets after inadequate treatment—adding to the municipal burden of the care of the unfit—be rationally treated and returned to health and self-supporting competency. The primarily normal sufferer, innocent victim of circumstances or of misguided or unavoidable medication, will be treated as any other patient in his home, in the general hospital, in reputable sanitaria, or in competently managed and equipped public institutions, according to his wish and purse and the desires of himself and his physician. With study and education, medical and lay, will come a rearrangement of our present attitude toward morphinism and of the treatment of its victims, and in its place will stand as a part of the ethical, rational practice of medicine, the treatment of a new disease.

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## EDDYISM, OR CHRISTIAN SCIENCE.<sup>1</sup> Considered Medically, Legally and Economically.

BY

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*"The devil can cite Scripture for his purpose."—Shakespeare.*

Eddyism is a community neurosis and may be treated as a disease.

**SYNOMYS.**—Eddyism is most commonly spoken of as Christian Science. It is a pity that so fine sounding, so dignified, so alluring a name should have been chosen for such a colossal humbug, for anything so unchristian and un-scientific, as Eddyism. It is also known as Science (with a capital S), Divine Science, Mental Healing, and New Thought. Those who are not its dupes speak of it in less complimentary terms. The believers in Eddyism are called Eddyites.

**DEFINITION.**—Eddyism is the practice of medicine under the guise of a religion. It is not merely a doctrinal system, a belief, but also a practice. There are many people who profess to believe in the teachings of Mrs. Eddy as a religion and as a method of healing disease; then there are those who practice the art of healing by Eddyism. So we have the faithful and the healers. The faithful are dupes; the healers are knaves.

The definition of Eddyism I have just given is not that of the Eddyites. According to them Eddyism is "a religion whose foundational truths are the reality and allness of God, the unreality and nothingness of man and the universe, the omnipotence of good, the impotence of evil."

<sup>1</sup>Read before The Medical Alliance, Nov. 24, 1915.

THE TREATMENT.—As a method of treating the sick Eddyism consists in convincing the disciple that salvation is possible and within the reach of all who faithfully and earnestly strive for it. They point out that Jesus proved what man may do through absolute reliance upon God, and they teach the sufferer or sinner to accomplish the same marvels. They insist, however, that in all this there is nothing miraculous or supernatural; it is all supremely natural. As Mrs. Eddy says (in "Science and Health, with Key to the Scriptures") : "The physical healing of Christian Science results now, as in Jesus' time, from the operation of divine principle, before which sin and disease lose their reality in human consciousness, and so disappear." In other words, Eddyism is only the revival of the healing work of Jesus and the Apostles. At the same time the Eddyites maintain that there is no such thing as disease, that what ordinary mortals call disease is only fear or loss of relation to God, and that this relationship can be restored by "prayer." Disease, like sin, is only an error of the "carnal mind"; it can be got rid of by convincing the sufferer of the unreality of his complaint, notwithstanding the evidence of his senses. Thus the sick are healed and the sinners are reformed. The giving or taking of medicines for the relief or cure of an error is a violation of the laws of God and, therefore, a sin.

Inasmuch as "space is no obstacle to Mind" the sick can be healed without coming in direct contact with the healer, i. e. though the healer and the patient are miles apart—provided the fee for such "absent treatment" has been forwarded in advance. But it must not be assumed that the results in these cases, if there are any, are due to a meeting of mind with mind, for even

young infants, imbeciles, idiots and lunatics can be cured—even by "absent treatment." Just as it is possible to do good by "wireless Eddyism," it is possible to do harm by it. (Mrs. Eddy insisted that her husband was murdered by arsenic administered metaphysically).

ORIGIN AND DISTRIBUTION.—Both Eddyism and the Bacon-Shakespere craze were "made in America"; both hail from puritan (hypocritical) New England; both were discovered by hysterical women, and both find their adherents among the ignorant and semi-educated. I mention these facts for what they are worth. Owing to the peculiarity of our institutions, the mixed character of our peoples, and our worship of the dollar, this country is peculiarly favorable to the outgrowth of all sorts of fakes and freaks in art, literature, science, politics and religion. The medical history of the United States is disgraced by such humbugs as Thompsonism, Emmanuelism, Ralstonism, Osteopathy, Vibratology, Chiropractic, New Thought, etc., every one of which has or has had a considerable following. Since 1886, the year of its discovery and invention, the growth of Eddyism has been very rapid. Now there is hardly a single civilized country in which there are no Christian Science churches and societies. It is said that there are now about one million believers throughout the Christian world. In the United States alone there are upward of four thousand healers. As might be expected Eddyism flourishes most in the English-speaking countries, America, England and Australia; but it is also found in Germany, France, Italy, Switzerland, China and the Bahamas. In some of these countries Eddyism is tolerated because of the jealousy with which people guard their right to

religious freedom and because the health of the community is not yet the business of the community.

#### EDDYISM AND THE MEDICAL PROFESSION.

—To the medical profession Eddyism has a twofold interest, one egoistic or selfish, and the other altruistic. The practice of medicine is to us a means of earning a livelihood; to put it bluntly, it is our business. We have all spent years in obtaining the necessary preliminary or academic education and then three or four years in obtaining a medical education; after that one or two years in a hospital; and after that years of work in various dispensaries—all with the object of equipping ourselves for the practice of the healing art. The law sees to it that we all comply with certain requirements, that we all measure up to a certain standard, ere we are permitted to practice our "mystery." Inasmuch as the law demands so much of us before licensing us to practice the healing art, it must be our business to see to it that nobody be permitted to encroach on our domains who is not similarly equipped and restricted.

The patients we lose through the activities of the Eddyites are the fairly prosperous middle class—lawyers, actors, school-teachers, writers, amateur art enthusiasts, and the nouveaux riches. No really educated person can be found among the Eddyites. The dupes of Eddyism are the people who can best afford to pay for professional services, who are most frequently afflicted with long-lasting and not too serious ailments, and with whom the best results can be obtained. The victims of Eddyism are rarely those who cannot afford to pay for medical services. Eddyism does not flourish among the poor. The Eddy healers do not locate themselves in the poorer sections of

communities, and thus far no dispensaries have been opened anywhere for the free treatment of the poor. Charity and Eddyism are not often associated.

**DANGERS FROM EDDYISM.**—From an altruistic point of view we may say that Eddyism is a menace to the community in a two-fold way. In the first place, patients suffering from grave organic maladies are lulled into a sense of security and encouraged to neglect themselves. Owing to the absence of proper precautions in acute ailments, (e. g., scarlet fever, diphtheria, rheumatism, etc.), all sorts of serious complications (renal, cardiac, etc.), are invited and the sufferer is doomed to go through the rest of his life with distressing chronic ailments. This also means diminishing a person's earning capacity and correspondingly robbing his family or the community. In other cases the absence of appropriate medical attention in acute ailments may, and often does, result in death. In many subacute and chronic ailments, e. g., tuberculosis, cancer, etc., the patient's delay in obtaining prompt and appropriate treatment may result in such an advancement of his disease that then medical or surgical intervention is of no avail. In the case of communicable diseases there is also danger of spreading the infection broadcast and depriving others of money, health and life. As with all psychotherapeutic treatment administered by incompetent persons, there is great danger of the patients becoming the slaves of the Eddy healers.

In the second place, Eddyism fosters and encourages mysticism and superstition. In 1878 Mrs. Eddy had one of her partners arrested on the charge of witchcraft. Ministers object to Eddyism on the ground that

it sets up a false religion, but with that we, as physicians, are not concerned.

DOES EDDYISM CURE?—To deny that Eddyism cures a large number of sufferers of a long list of more or less distressing ailments would be as absurd as to deny the occasional curative influence of touching the shin-bone of St. Anne or of kissing the Host at Lourdes. The ailments cured, partially or wholly, temporarily or permanently, by Eddyism are, it is true, exclusively those that we call psychoneuroses, familiarly known as "nervousness," psychasthenia, neurasthenia, neuroses, compulsions, phobias, and hysterias. These are the ailments that can, in many cases, be cured by laying on of hands, by wearing amulets, by any method of suggestion, by hypnotism, by persuasion (Dubois), by psychoanalysis (Freud). Eddyism is really only a form of psychotherapy; as such it can, and does, cure neurotics of a certain kind. Besides, we must bear in mind that many neurotics cure themselves when they are left to their own resources, i. e., when they must get well or starve. A large number of the neurotic wrecks of civilization are cured on the occurrence of certain events, e. g., marriage, the birth of a child, the death of some relative, etc. It is notorious that unmarried elderly ladies undergo wonderful cures on marriage and unhappily married women on the deaths of their husbands. Nor must we forget that there is a fairly large class of organic ailments that are cured spontaneously during the course of time. If the sufferer happens to be undergoing some form of treatment during this time he is very likely to attribute his cure to the treatment.

It must not be inferred, however, that Eddyites limit their activities to the treat-

ment of neurotics. Oh no! That would be barring the door to a large and lucrative class of patients, and would involve the—to them—impossible task of making a differential diagnosis. To an Eddyite all diseases are only the dream of a mortal mind; therefore one is not more real than another; an organic disease is as much the product of mortal suggestion as a so-called functional disease, and therefore just as easily curable—by Eddyism—as a neurosis.

WHY EDDYISM FLOURISHES.—From a consideration of the kinds of invalids who are benefited by Eddyism we are prepared to take up the consideration of the causes why this religio-therapeutic system flourishes in so-called civilized and Christian communities. The reasons are several.

(a) *Ignorance*.—The first and most important of these reasons is ignorance—ignorance of the anatomy and physiology of the body, ignorance of the nature of disease, ignorance of the laws of the physical world. Credulity goes hand in hand with ignorance. As long as supposedly sensible people, even supposedly educated people, spend millions of dollars annually for ornamental rabbit's feet as a cure for epilepsy, or electric belts for the cure of hernia, or brass rings for the cure and prevention of rheumatism, etc., Eddyism or any other humbug, is sure to thrive. Credulous fools are caught with any bait.

(b) *Mysticism and Superstition*.—The savage, the child, and the uneducated person are kin in that they refer all natural phenomena they do not understand to external agencies, to mysterious, invisible spiritual agencies. Their "untutored mind sees God in clouds and hears him in the wind; their soul proud science never taught to stray far as the solar walk or milky way." It is the same with the neurotic, who is really only a civilized savage, i. e., a primitive being striving to live up to the ideal of a highly civilized community. The nervous person is one who has become a psychic wreck because of the conflict within him between his elemental desires or passions and

the ethical and religious ideals that have been drilled into him. He is suffering from over-civilization. Unable to understand the conflict going on within him, he attributes his condition to spiritual forces, to something outside himself of an invisible and impalpable nature. In former times neurotics thought themselves possessed by the Evil One or his agents. The community—and the medical profession too—took the same view, and these unfortunates were prayed over to expel the devil within them. If they survived this and the devil was not thus expelled, the hysterical and the lunatic were publicly whipped; and if this failed, they were burned at the stake. Today we mask our superstition and mysticism by calling it religion; and if we get our education from the magazine sections of the Sunday newspapers, we justify our superstitious customs and habits by referring to the unsolved mysteries of nature, telepathy, wireless, x-rays, animal magnetism, spiritualism, etc. In such a community Eddyism has as much right to thrive as a religion as Judaism, Christianity, Theosophy, Quakerism, Shakerism, or any other.

(c) *The Need for a Religion.*—From our latest studies of the psychoneurotic we know that the "nervous" person is one whose ideal moral and ethical ego is in conflict with desires that he wishes to keep out of his consciousness. He does not want to know the wicked and criminal impulses that possess him. By "wicked and criminal impulses" I mean those desires that he was taught to consider wicked and criminal. The bank-teller who finds it difficult not to yield to the impulse to steal the money that passes through his hands—the lawyer who is tempted to rob his client and cheat the law—the married lady who would take unto herself a lover and yet would retain her honor—the husband who would be rid of his wife, but will not be a murderer—the virtuous stenographer who longs for a liaison with her married employer but fears the loss of her reputation and chastity, etc.—all these break down and develop a neurosis. They do not know what is the matter with them, but they are dimly aware of the fact that in their hearts they have been guilty of theft, adultery, murder, etc., that they are sinners, and—remembering what they were taught in their childhood—they crave for the ministrations of religion. But

the orthodox Christianity, especially Catholicism, terrifies them, affrights them, repels them. They want a religion of love, a religion free from hell and damnation. Christian Science pretends to be such a religion, and our neurotic takes to it—for want of something better. Mrs. Eddy herself tells us that she was led to the invention of her new faith by her revolt from the inhumanity of extreme Calvinism. To the modern semi-cultured individual the Jewish religion is hardly a religion in the modern sense of the word. That is why so many Jews take up Eddyism—when they are sick—and until they are cured.

When we know the attitude of the Christian Science Church to sin and the devil we understand why the neurotic, the unconscious criminal and sinner who lacks the courage to commit the crime or sin that obsesses his soul, takes to this religio-therapeutic system. Eddyism strives to convince its votaries that "evil has no reality, but is simply a belief, an illusion of material sense." God, which is goodness, being everywhere, there can be no such thing as evil, the opposite of goodness. So, too, sin, sickness and death are without a real origin or existence, but belong to the nothingness of error. A comforting doctrine to the unconscious criminal, the neurotic!

(d) *Medical Ignorance of the Psychic Factor in Disease.*—Medical science has been largely responsible for the growth of the monster Eddyism. Just as the orthodox religions failed to satisfy the spiritual needs of unconscious sinners, so the orthodox medical science failed to satisfy the psychic needs of unconscious criminals. Spiritual and psychic invalids cried for relief in vain. The psychoneuroses have always been the step-children of the medical profession.<sup>1</sup> Even today the medical profession, as a body, knows little or nothing of the psychology, etiology, pathology, and therapy of the psychoneuroses and the so-called functional diseases. Until very recently the medical profession scoffed at the possibility of cur-

<sup>1</sup> The profession has too long cherished the error that it cannot

"Minister to a mind diseas'd,

Pluck from the memory a rooted sorrow,  
Raze out the written troubles of the brain,  
Cleanse the stuff'd bosom of that per'rous stuff  
Which weighs upon the heart"  
and that therein the patient must minister to himself.

ing serious ailments, distressing symptoms, by suggestion, by hypnotism, by mesmerism, by persuasion, etc., and refused to take these things seriously. Our "nervous" patients read our ignorance and our indifference in our faces; they were not cured by being told to "forget it" or to take a trip abroad, or that their complaints were "imaginary." We drove them to look for help elsewhere. It was perfectly natural, then, that when a body of apparently sincere men and women announced the healing power of the Master's word a host of sufferers should have flocked to them and poured gold, gold in abundance, into their laps in return for promised health. Mrs. Eddy, her intellect sharpened by the pinch of poverty, knew how to turn the knowledge she gained from Dr. Quimby, while he was treating her for hysteria, to good account.

Remembering what we have said of the pathogeny of the psychoneuroses, it must be obvious why a doctrinal system that promises both spiritual and psychic relief should meet with such success. If physicians would also consider that even in the organic diseases the psychic factor plays a very important role in contributing to the patient's sufferings, they would understand why Eddyism has so many invalid adherents who are apparently not neurotic. The medical profession is in a position to know that to some extent all human beings living in a state of civilization are neurotic. The failure of the profession to note and to heed these facts is responsible for the pervading ignorance of the psychic factor in disease, of the influence of the mind upon the body. That is why in all the states of the Union, but four, the treatment of disease by metaphysical means is not considered as constituting the "practice of medicine." The code of Georgia provides that any one who attempts to cure, relieve or palliate any ailment or disease of the mind or body by "any drug, medicine, appliance, apparatus, or other agency, whether material or not material," is practicing medicine. Notwithstanding this truly admirable law, Justice Hill (in the case of *Bennet vs. Ware*, 4 Ga. App. 293, 61 S. E. 546) ruled that the code "was not intended to regulate the practice of mental therapeutics, or to embrace psychic phenomena. These matters lie within the domain of the supernatural." Another instance of Georgia justice!

Very important among the causes of the popularity of Eddyism are the therapeutic nihilism of a large number of ignorant and unskilled physicians, the absurd extremes of homeopathy, and the dishonesty and charlatanism of a not inconsiderable number of physicians. In the case already quoted Justice Hill aided a psychic healer to evade the obvious intention of the law by insisting that the administration of drugs is essential to the practice of medicine and that the code does not apply to those who do not believe in the use of drugs. The learned Justice remarked that the law was not intended to apply to those who believe with Dr. O. W. Holmes "that it would be good for mankind, but bad for the fishes, if all the medicines were cast into the sea." The poet-doctor's witty exaggeration cost us dear.

Other important factors in the spread of Eddyism are the excessive scepticism, dogmatism, intolerance and petty jealousies of a not inconsiderable number of physicians who do not scruple publicly to abuse and vilify each other for the sake of a little notoriety and self-advertisement. Consider the evil effects of the ridicule and vilification that has been the reward of so many of the pathfinders in medicine, e. g., Lister, Pasteur, Jenner, Semmelweis, etc., and now Freud! These things do the profession no good. Our enemies know how to turn these things against us.

The ranks of the Eddyites are also swelled by a horde of sickly idealists, sentimentalists, and esthetes—all of whom are really only the victims of excessively repressed sexual cravings. To these we must also add a few lawyers and business people, and a large number of fakers, who embrace anything that promises to pay. Many women take up Eddyism as a business in the same way that they would take up midwifery, nursing, or massage—only Eddyism is more "genteel" and more remunerative. Any one may obtain a Christian Science diploma after taking a course of twelve lessons for \$100.00! For self-supporting women it is a godsend.

How EDDYISM CURES.—I cannot refrain from adding a few words of explanation as to how Eddyism cures neurotics of their symptoms. The Eddy writings tell us that the faithful are cured by the power of the

divine Principle, by belief in the healing potency of His words. Freud has taught us that all psychotherapy depends for its effects on "transference." The neurotic Eddyite identifies himself with Christ and so bears his cross without complaint, like the martyrs of old. The undisguised pantheism of the Eddy teachings, the masked piety of the neurotic, his reaction to the sinful and criminal stirrings within him, his characteristic paranoid complex and his belief in the omnipotency of his ideas easily bring this about.

**REMEDIES.**—How is Eddyism to be combatted? Were I inclined to be cynical I would say, speaking as a practicing physician to physicians: "let's all become Christian Science healers!" For be assured that invalids would sooner consult an Eddyite who is also a graduated physician than one who is not. Most, almost all, Eddyites rush for a "real doctor" as soon as they fear that something serious is the matter with them. They know the difference between their psychic pains and their somatic pains. (On December 2d, 1900, Mrs. Eddy herself had a carious tooth extracted under local anesthesia by a licensed dentist). Religion is almost universally a profitable side-line, especially to a physician.

But speaking from a larger and broader point of view I would say that the evils from Eddyism can be prevented by two measures: education and legislation.

As to the education of the public I have nothing to say now. The truths of science ought to be brought home to the minds of all so convincingly that pseudo-scientific nonsense and pseudo-spiritualistic vaporings should be at once recognized as such. The smattering of education which is the lot of such a small proportion of our people, even our leaders, is hardly deserving of the name

"education." Every medical school ought to be required to give a thorough course in psychotherapeutics. The profession should realize that in general practice nothing is more important than psychotherapy. In many unfortunate cases we have no other remedy.

Under the head of education I would also include the reformation of current religions. It is just as stupid and just as wicked to frighten adults into being "good" by threats of damnation, hell, the devil and the sulphurous pit, as it is to frighten little children with the bogey-man. Fear should have no place in modern education. Fear is an important element in the neuroses and in most diseases, but not in the sense in which the Eddyites employ the term.

**EDDYISM AND THE PRACTICE OF MEDICINE.**—Before we invoke the aid of the law in the suppression of Eddyism we must answer two questions: what constitutes the practice of medicine, and is Eddyism the practice of medicine? These questions have come up in the courts of almost every state in the Union and elsewhere, and have been answered differently in the different states, the decisions being determined by the ingenuity of the judges or the political influence of the Eddyites. To an uncritical and unsophisticated layman the "practice of medicine" is synonymous with the "treatment of disease." Eddyites and other metaphysical healers object to this definition on the ground that their system of healing bears little or no resemblance to the established system of healing diseases, inasmuch as they make no use of drugs or medicinal substances. They insist that the practice of medicine consists in the treatment of disease by means of drugs or by some manipulation. Common sense cries out against such a narrow definition. Sug-

gestive treatment, psychotherapy, is an essential part of the practice of medicine. A physician is practicing medicine though he administer no drugs or prescribe only a placebo. It has been held by some that a person is practicing medicine if he gives medical advice in return for a fee or an expected gratuity. But this definition is open to the objection that a physician is practicing medicine though he does so gratuitously, e. g., in dispensaries, etc. In the State of Missouri it has been held that a person is practicing medicine when he visits his patient, (or is visited by him), examines him, investigates the course of the disorder, determines the nature of the disease, and prescribes the appropriate remedies, (*State v. Smith*, 233 Mo., 242, 135 S. W. 464). They might have added if he is a graduate of a medical school and has an "M. D." degree.

In 1807 the Supreme Court of New York, the first state in which this question came up for determination, said that the "practice of medicine—includes the application and use of medicines and drugs for the purpose of curing, mitigating or alleviating bodily disease." (*Smith v. Lane*, 24 Hun. 632). Subsequently the same court ruled that diagnosis is the "very corner stone of successful medical practice." (*People v. Alcutt*, 117 App. Div. 546, 102 N. Y. Supp. 678, 189, N. Y. 517). The joker in this decision is the introduction of the word "successful." Making or not making a diagnosis may be essential to successful medical practice, but that has nothing to do with the question "what constitutes medical practice." Our courts always find reasons for deciding the way they want to decide.

The Supreme Court of Tennessee (*O'Neil v. State*, 115 Tenn. 427) ruled that "the practice of medicine rests largely on

a knowledge of anatomy, physiology and hygiene. It requires a knowledge of disease, its anatomical and physiological features, and its causative relations." The absurdity of such a limitation is in the fact that it permits those who know nothing of anatomy, physiology, hygiene, chemistry, pathology, etc., to treat diseases without a license, whereas those properly equipped in this regard must obtain a license to do so. According to the definition just quoted a psychic healer, a metaphysical healer, a magnetic healer, a cosmopathic healer, a chiropractor, etc., is not practicing medicine because he knows nothing about disease, he does not know what he is doing, why he is doing it and what he can accomplish.

Some of the courts have refused to consider the medical activities of metaphysical healers as coming under the definition of the practice of medicine because that would put an end to their activities and thus invalids would be deprived of the right to resort to a practitioner of their choice, and thus the healing art (which, they say, is still in its infancy) would be hampered in its growth. It has also been contended that the law cannot make that the practice of medicine which in fact is not such—without first deciding what the fact is. In North Carolina and in other states (Ky., Miss.) the courts have refused to include healers under the definition of the practice of medicine because that would prohibit their activities and thus the law would give the "doctors in surgery and medicine" a monopoly of the healing art. Other courts have taken the view that a mode of healing can be regarded as the practice of medicine only if it involves the diagnosis of disease. The objection to this is, of course, that it puts a premium on ignorance, that it imperils the health of the community by exposing it

to the charlatanism of those who will not and cannot make a diagnosis.

After this dreary summary of the stupidities of some of our law-givers, it is a pleasure to add that of late there is manifest in some of the states and decisions an unmistakable tendency toward holding that the practice of medicine is co-extensive with the treatment of disease, and that any person who holds himself out to the public as a professional healer of disease, regardless of the curative agency employed, whether for a fee or gratuitously, is practicing medicine, notwithstanding that the treatment bears not the slightest resemblance to medical practice as understood and conducted by physicians. The laws of Colorado, New York, Nebraska and Ohio leave nothing to be desired in this respect. In these states it has been affirmed that suggestion or mental therapeutics "bears no relation to the exercise of religious beliefs or principles and is not protected by provisions in a medical practice act which exempts from its operation the practice of religion of any kind of treatment by prayer." The practice of Eddyism is a misdemeanor.

It stands to reason that those who have been accumulating wealth from the improper practice of medicine will not tamely submit to laws prohibiting their activities. The decisions recently given by the Supreme Court of Rhode Island (*State v. Mylod*, 20 R. I. 642) and Missouri (*Kansas City v. Baird*, 92 Mo. App. 204) show that the sophistications of the Eddyites are potent to overcome the dictates of common sense and the arguments of the medical profession. The dissenting opinion recently written by Justice Dowling, from which we quote, shows that even in New York the matter is not yet finally settled, and that the danger from Eddyism

is present and real. Says Justice Dowling: "I do not believe that the pursuit in which the defendant [an Eddy healer] was engaged was the practice of medicine. The defendant disavowed any personal ability or power to influence or affect the condition of the person asking relief, and urged in every possible way the view that God alone could cure what was called disease [but Quinine cures Malaria], and that those who lived honest, pure and kindly lives would remain well [although we know that this is not so]. He emphasized the fact that God was the only healer [Christians, real Christians, believe this too, yet do not commercialize it] and that prayer to God was the only efficacious means for relief [and yet Eddyites do not believe in prayer and do not pray]. He practiced no deceit [although he pretends to believe what he knows cannot be true]. Starting with the negation of the existence of disease as a physical fact [an obvious absurdity] and following it up with the statement that what is ordinarily recognized as the presence of disease is simply evidence of a lack of harmonious relation with the Almighty, he suggested as the only recourse the restoration of a proper spirit of harmony with, and obedience to, the Maker, which condition could be brought about by the person who came to him for help without his assistance. He made no diagnosis; he made no effort to determine the existence or non-existence of any specific disease; he performed no manipulation, or any physical acts." In other words, Eddyism and medical practice are totally unlike, have nothing in common, are contraries, merely have a common purpose. The learned Justice errs, however, in his failure to consider mental therapeutics as an accepted and essential branch of medicine

and in exaggerating the importance of material agencies and manual manipulations as remedial measures. The Eddyites very shrewdly style their treatment of the sick "prayer," but inasmuch as they do not plead with God to deliver the afflicted from their suffering, they say that prayer is "a knowing that sickness and suffering have no existence in His presence." But surely our lawgivers would not permit public flagellation simply because some fanatics called it prayer! The health of a community is as much a matter for legislative control as its morals and is too important a matter to be exposed to the vagaries of ignorant and unscrupulous charlatans masquerading behind a cloak of religion. Moreover, Eddy healers are guilty of deliberate falsehood when they assert that they limit their activities to praying. Their own accounts of their "cures" show that they advise their clients to exercise, to walk, to diet, to use their palsied limbs, to refrain from alcoholic drinks, to discard their eye-glasses, to discard their crutches, to stop smoking, etc. And, most important of all, they labor incessantly to induce in their patients the belief that they are not sick.

**PRACTICAL SUGGESTIONS.**—According to the laws of New York, Nebraska, Ohio and Colorado, an Eddyite who attempts to cure a person who is sick or believes himself to be sick is guilty of an indictable offense against the statutes regulating the practice of medicine. The Eddyites annually expend vast sums of money to modify these statutes in a manner that their activities shall be construed as constituting the practice of the religious tenets of a church.

Inasmuch as the medical profession is in a better position to know the truth about health and disease than any other body of men and women, inasmuch as the medical

profession has from time immemorial devoted all its efforts to conserving the health of the community and to stamping out disease, and inasmuch as our own personal interests are jeopardised by the medical activities of the Eddy Healers—it is the business and duty of the medical profession to wage incessant war on the Eddyites, to watch over the activities of legislatures, to keep a wary eye on the conduct of our courts and to prosecute every breach of the law. To do these things effectively the medical profession must be well organized under the guidance of young, modern, ambitious, public-spirited, broad-minded leaders. The activities of former medical associations, under the guidance of old-fashioned, unpractical, narrow-minded and over-conservative book-worms, or snobs indifferent to the interests of the general practitioner have permitted all kinds of quackery—one of the worst of which is Eddyism—to encroach on the domains of medical practice. If the County Medical Society and the Academy of Medicine had been more vigilant and more active osteopaths and optometrists would not now enjoy the privileges they do.

The rising generation of medical practitioners must be aroused to the dangers of improper encroachments on their proper domain and must be exhorted to unite to protect their interests and must be induced to surrender up an infinitesimal part of their incomes annually to defraying the expenses incurred by unselfish leaders in the doing of these things.

3681 Broadway.

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**Emetine Hydrochloride.**—Dr. Frazier (*Med. Summary*) states that emetine hydrochloride is used to abort typhoid fever. One-half grain is injected.

## THE INFLUENCE OF PHYSICIANS IN PUBLIC AFFAIRS.<sup>1</sup>

BY

IRA S. WILE, M. D.,  
New York City.

Had the medical profession been true to its traditional origin in the priesthood, its power in public affairs would undoubtedly have been far greater than it is today. The original exclusiveness of medicine in its professional dealings tended to prevent the largest participation in public life by reason of the centering of activities in the homes of patients. The history of our own country, however, indicates the power which was wielded by many self-sacrificing medical leaders during the period of origin of our Government.

The medical signatures connected with the Articles of Confederation of the United States and the ratifying signatures to the Constitution of the United States testify to the high position in civic life attained during the pre-revolutionary days and during the strenuous years following the American revolution. The medical pioneers were ministers, pharmacists, soldiers, agriculturists, botanists, writers and civicists. Their sphere of influence in colonial days and during the struggling period of the United States embraced the results of their communal duties as pastor, schoolmaster, and physician.

A man like Benjamin Rush of Philadelphia, who was a lecturer in the University of Pennsylvania, physician-general of a hospital of the middle military department, a member of the convention for drafting the Constitution of the United States, treasurer of the United States Mint, a signer of the

Declaration of Independence, and a voluminous writer on numerous branches of science made his impress upon the civic affairs of his day.

Jonathan Elmer of New Jersey not only practiced and lectured in medicine, but served his community as sheriff, as a delegate to the Provincial and Continental Congresses, and was in turn a county clerk, a judge of probate, and a United States Representative and Senator.

Such brief histories could be given of countless members of the medical profession whose influence in public affairs redounded to the credit of their personal civic strength and their medical training. It is unnecessary to enumerate the types of activity in public life which gave honor and reputation to our colleagues of the past from the days of the formation of our Government through the times of strife in '61 down to the present year.

If it be thought that the sphere of influence of physicians has been narrowed it is not because the opportunity for public service has been lacking, but because of a lack of desire on the part of physicians to participate in public affairs or else their failure to grasp at favoring opportunities. It cannot be gainsaid that the transitional state of medicine, from which we are just emerging, busied the profession with a multiplicity of the personal relations forming the well known picture of the old family physician. His influence was distinctly felt, though the direction of his power was through indirect efforts save in times of crisis when he rose to the occasion and stood before the public pointing a finger of warning and lifting a resounding voice in the interest of the public weal.

With the exception of the written directive and corrective influences spread through

<sup>1</sup> Read before American Medical Editors' Association Oct. 18, 1915.

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the power of writers like Holmes or Mitchell, or the special workers in science, philosophy, and kindred cultural branches, the largest effort of the profession was spent upon the development of medicine itself. This tendency was manifest in the character of the medical journals until a few years ago. For the past five years there has been an increasing and broadened literature on public health, noticeable in the development of our medical journals. This public interest extends, indeed, to the medical writings on health topics in journals devoted to the discussions of sociology, philanthropy, and indeed in the popular current periodicals. Apparently, the opportunity for approaching the public mind, for awakening the public conscience, and for stimulating public thought is present today to an extent undreamed of a decade ago. Regardless of the ethics of the profession, the practice has developed of promoting publicity within reason for the thoughts of medical leaders desiring to place the stamp of their personal opinions upon the literature of current life.

The field of public health was being seized by nurses, social workers, sanitary engineers, and philanthropists, and it was but natural that the physician should be drawn into the vortex. The popularization of medical thought in terms of social welfare has borne rich fruit in the extension of public lectures, popularly written pamphlets, and stories for secular distribution. Through all these means the influence of physicians has been felt in public affairs in so far as they concern the protection of human life.

If today problems relating to tenement houses are discussed, physicians are urged to express their views. If reticence on their part interferes with their public expression

of thought, an opportunity is lost. If a problem of public baths or public laundries is agitated and physicians do not rally to participate in the discussions relating thereto, they are permitting their potential influence to lapse into uselessness.

There are few agencies in civic affairs which do not directly or indirectly have some bearing upon health. It matters not whether the public concern be in terms of surface railways or in the determination of a workingmen's compensation act. The horizon of medicine must be broadened in order to secure the maximum influence possible.

Regardless of the relation of the physician to his own profession, his position in the community is that of a teacher. The term "physician" dates back to the significance of a naturalist. The word "doctor" is derived from "to teach." The Hebrew term connoted "mending." The word "leech" itself came from the good old Saxon word meaning "one who provides." Philologically, the physician should be a naturalist, a healer, a mender, one who provides and a teacher. These very derivations indicate the latent qualities which should stimulate the profession to greater activities, based upon their higher responsibilities for the progress in any age. Belonging to a group of citizens with superior training, wider sympathies, and trained judgments, there is a responsibility for participation in the social movements of the times beyond the average of most other workers in the world.

In so far as matters of legislation pertaining to the welfare of the medical profession itself, the influence of the profession has been less than its opportunity demands. The characteristics of medical legislation today, with their impulsiveness due to lack of adequate consideration, based upon fanatic theories, lacking in practical-

ity, bear witness to the feeble efforts waged by the profession against such enactments.

At times the conscience of a state medical society is pricked and even goaded into violent efforts to stave off some unusually atrocious law and at such times their efforts are generally crowned with success. But how weak, however, has been the influence of organized medical societies in guiding the councils of our legislators into formulating wise and sane legislation in matters pertaining to public health. So many examples immediately occur to you that it is unnecessary to suggest particular illustrations.

Fortunately, there is a slow awakening by organized medicine as to the importance of maintaining standing committees on public health or legislation in order to advise the community of the attitude of the medical profession about matters of communal interest.

We must distinguish between the influence of physicians in public affairs born of a sense of civic responsibility, and that personal influence arising from political activity. Regardless of internal dissension in the profession, usually upon matters pertaining strictly to professional life and duties, the large sense of civic responsibility should be fostered. The responsibility of physicians in public affairs is greater than it was a generation ago, or indeed, a decade. Vast new fields of influence have been opened. Political aspiration means service and influence of only a few men. Usually this means primary interest in private affairs. Let me confine myself to the broadest meaning of public affairs. Medicine has been liberalized and socialized. Its activities have transcended the narrow confines of family duties to the entire field of civic life. The doctor has become a true

social agent. Civic service spells influence for every citizen. The influence of a single director of public health education is more keenly felt today than was the united effort of a hundred physicians ten years ago.

The bulletins issued by city, state and national bureaus over the signatures of medical men are exerting a constantly broadening influence upon public life. The development of civic improvements, stimulated by departments of child hygiene, are indicative of the possibilities of well directed activity on the part of high thinking medical minds. These activities are but reflections of the potential influences of departments of health and medical thought.

Another powerful source of influence is existent in the indirect action of physicians affiliated with sociological organizations, though their efforts are manifest merely in the determination of policies reflected by the literature and the voice of the executive secretaries of such organizations. The effect, for example, of physicians connected with organizations like the New York Milk Committee cannot be estimated except as one appreciates the value of the work that has been accomplished by the National Commission on Milk Standards. There has been no personal glory, but the power for betterment has been manifest in the improvement of milk supplies throughout the country.

There are numerous organizations, such as The Association for the Prevention of Tuberculosis, The National Association for the Conservation of Vision, The American Association for Mental Hygiene, The Society for Sanitary and Moral Prophylaxis, and The American Association for the Study and Prevention of Infant Mortality, whose effect upon public affairs has been more widespread than is generally appreciated. Through connection with such organi-

zations, the influence of physicians may be felt and spread broadcast throughout the country, a power for national betterment.

Association with charitable organizations, with associations for labor legislation, and with any other type of society organized for public improvement affords abundant opportunity for reflecting the opinions of medical thinkers. I realize that physicians have no time to waste, but hours devoted to the cause of public service are not sacrificed, they are rich in their rewards. Public service fearlessly given, honestly offered, and conscientiously supported dominates the thought of civic minded citizens of all professions.

As citizens, parents, and physicians our interests in the school are of sufficient importance to demand greater education on the part of the profession to the needs and possibilities of the public school system. Such service may well be secured through direct contact with the problems by active participation in the work of local school boards or boards of education. This sphere of influence has always been appreciated by the profession and the training of physicians has made them appreciated members of such educational bodies since the early history of the public school system.

It is not only in questions of education, however, nor indeed of the health department wherein medical influences should certainly be felt, but the functions of street cleaning departments, tenement house departments, departments of public charities and departments of corrections are sufficiently vital and bound up with the highest traditions of medicine to warrant the cordial cooperation of the medical fraternity in every plan proposed for the alteration, extension or improvement of these departments of civic life.

Merely to devote editorial notice to the problems of civic life is insufficient. One thing that is necessary is for the editors of medical journals to stimulate their readers not merely to interest in problems of public affairs, but to encourage their actual participation in every way possible in such public problems. Furthermore, the impetus to stir up communal activity along various social lines should be so marked that medical societies in themselves would take the initiative in suggesting plans for public improvements without waiting to be led into channels of activity with only half-hearted interest.

Physicians as a rule enjoy the confidence and respect of their fellow citizens. Their views are listened to with interest, their enthusiasms spread by contagion, and their vital interests in the welfare of the community involves the vitality and opportunity for self-development of every citizen. It would seem therefore, of paramount importance that physicians realize their responsibility individually and collectively as potential health officers, as teachers, as menders and healers. It must not be inferred that physicians have been entirely negligent in public affairs, but it is undoubted that but a small proportion of their potential power has thus far been exerted. With the wide knowledge gleaned by personal experience, with their intimacy with poverty, crime and debauchery as required in their daily professional life, they possess vast volumes of information which they alone can read to the multitude, and the reading thereof with a voice of conviction is sufficient to stimulate almost any community into a new emotional response in behalf of their suffering fellow human beings. In fine, the influence of physicians in public affairs is only limited by their vision.

Their opportunities are numerous. Their potential power is dependent merely upon their personal or organized efforts to rise to their opportunities.

Herein may the influence of medical editors be felt. As leaders in directing the thought of our professional brethren, we possess a more serious responsibility for indicating the immense storehouse of energy which can be diverted or directed to public life. Our influence in public affairs must not be confined to the benefits accruing to the public from the raising of medical standards, or the development of therapeutic measures, or praising the accomplishments in preventive medicine. As citizens, as well as medical editors, our influence over public affairs must be felt through the indirect results of our efforts in stimulating the sense of civic responsibility existent in the minds of our subscribers. And lastly, in order that we ourselves may not be adjudged lacking in the efforts we seek to arouse in others, we must devote our thought and attention to the means whereby we may best assist our city, state and country by personal service, through voice and action. The most potent and effective influence in public affairs becomes possible for those who actively participate in human affairs and thus live and lead a public life. Wisely did Pericles proclaim: "We regard a man who takes no interest in public affairs not as a harmless, but as a useless character."

**Erysipelas.**—L. Labbé (*Paris Médical*) recommends the following for local application in erysipelas:

R. Ætheris ..... ʒiv  
Pulveris Camphoræ ..... ʒij  
Misce. fiat. pigmentum.

S. To be painted repeatedly over the affected surface.

## CATARACTS.<sup>1</sup>

BY

JOHN WELSH CROSKEY, M. D.,

Ophthalmic Surgeon to the Philadelphia General Hospital, Philadelphia, Pa.

Up until the eighteenth century any opacity of the eye was considered a cataract. The word, as Webster says, is derived from two Greek words meaning down, and fall. The ancients believed that the seat of vision was in the pupil and the appearance of any opacity in the lens directly back of the pupil made them think that it was a pouring down of new material. Some early authorities called a cataract "Aqua Descendens In Oculo." The Germans called a cataract a "Star." There is an old legend that states that if you drink water in which a bird known as a starling has bathed, you will become "star blind."

Previous to 1750 the operation for cataract consisted in what was called couching; that is, introducing a needle into the eye and depressing the opaque lens back into the vitreous chamber.

On April the 6th, 1705, in a hospital of Doornick, a surgeon named Brisseau performed an autopsy upon a soldier. One eye of the corpse contained a simple, ripe cataract. He first couched this and afterwards dissected the eye and found that he had depressed the lens into the vitreous. He reported this to the French Academy which totally ignored his announcement.

It was not until 1750 that one Jaques Daviel performed the first operation for the removal of the lens through an incision in the cornea. In this operation the incision was made downwards.

In about 1865 Von Graefe introduced his

<sup>1</sup> Notes from a clinic held at the Philadelphia General Hospital.

peripheral linear incision with a preliminary iridectomy, and there has been very little change in the method of operating since. Smith of India removes the lens within its capsule, but in this country this method of operating has not proved successful.

We have three kinds of cataracts: congenital, traumatic and acquired.

I may say that the cause of cataract is unknown. It is generally considered a senile degeneration. Any pathological condition which affects the eye ball may produce cataract. It is generally a secondary disease. We know that nephritic alterations, diabetes, exposure to great heat, various poisons, arteriosclerosis, auto-intoxication and eye strain are all predisposing causes.

From a clinical standpoint, we can divide the development of cataract into four stages: (1) incipient; (2) unripe; (3) ripe or mature; and (4) over-ripe.

The diagnosis of cataract to the general practitioner is not always easy. Among the things most taken for cataract are central opacities of the cornea; exudations upon the anterior capsule; the reflex seen in glaucoma and the sclerosis of the lens due to old age.

As a general proposition cataract having once affected the eye goes on until all the fibres of the lens are involved. There are, however, exceptions to this rule. When the degenerative changes are due to a curable condition, either local or general, an improvement or even a cure may occur.

After a cataract has formed it may become over-ripe and break down and partial vision may be restored.

You have all heard of "second sight" occurring in old people. This is a condition which occurs when the lens first begins to

swell; before any of its fibres become opaque.

The treatment of cataract is divided into —local, constitutional and operative; massage with various ointments (iodide of potash) internal and by sub-junctival injections. I have never had success as far as treatment goes. It is impossible to tell how fast a cataract will mature. I have seen them practically stand still for years.

Now the question arises when to operate. Most operators will tell you to wait until the cataract is mature or ripe. As a general proposition this statement is very good, but I believe that every case is a law unto itself. If a patient has cataracts in both eyes and is becoming blind, why should he wait? The operation on an immature lens is a little more difficult but with care the unripe lens may be delivered, and the patient saved a period of blindness. When a patient has one good eye we can usually wait, without there is some good cause for operating.

Recently I operated upon an attendant in the insane department of this hospital (Philadelphia General Hospital). He was only forty-two years of age and had an immature cataract in one eye. He had been struck several times by patients on his blind side, and he wanted protective vision on that side. I operated upon him on a Monday, and on the following Tuesday one week I showed him before the West Branch of the County Medical Society. In this case I washed out the anterior chamber with normal salt solution. This patient now has protective vision on this side.

Before operating a patient is seen the previous day. His bowels are thoroughly cleansed. A general, as well as a local bath is given; one drop of atropine is instilled in the eye to be operated upon, and

the eye is bandaged. The next morning the eye is examined to see how it tolerates the bandage. The eye is again washed; one more drop of atropine is instilled, and the eye is again bandaged. Some surgeons shave the eye brow, but I do not think that this is necessary. I use the atropine as it dilates the pupil, getting the iris out of the way, and it slightly increases the tension of the ball, which enables one to make the section of the cornea with more ease.

For anesthesia I use a solution of cocaine first; then I put some powdered cocaine directly into the eye. It is necessary to use the solution first, as the patient complains that the powder smarts and it is poor policy to cause your patient any discomfort let alone pain. The powdered cocaine produces complete anesthesia and patients do not even complain of the iridectomy. In the use of the powder, care must be taken to not let the cornea become dry, as the anterior epithelium may peel. I have been using the powdered cocaine now for four years without any bad results.

#### Bronchial Asthma.—

Sodii iodidi .....	
Tinct. belladonnae fol .....	
Tinct. hyoscyami .....	
Tinct. lobeliae .....aa f. 3ij	
Syr. pruni virg .....ad f. 3ij	

M. Sig.: One teaspoonful in water four times a day.—*Swan.*

**Saline Solution.**—Be a little careful in the routine use of saline solution, especially intravenously says *Med. Council*. Too much fluid overtaxes the heart and too much salt damages the kidneys. There is no doubt of its use, but doubtless it is also over-used by many. An isotonic 5.1 per cent. glucose solution per rectum supplies water to the system without overloading with sodium chlorid.

## USE OF FLUOROSCOPE TO AVOID LEAVING GAUZE PADS AND SPONGES IN ABDOMEN.

BY

EVAN O'NEILL KANE, M. D.,  
Kane, Pa.

An easy method of obviating the common difficulty with accounting for gauze pads and sponges after operation, which answers admirably, is as follows:

All gauze pads and sponges are stamped at one corner with a metal button. Under the fluoroscope with a powerful x-ray machine this button can be clearly seen at any depth of the abdominal or pelvic cavity, no matter how corpulent the subject. When there is any dispute or question, after the counting of sponges, as to whether or not one has been overlooked and lost within the abdomen, the patient is run into the adjoining x-ray room. Here, by a glance through the fluoroscope or the taking of a skiagraph, the question is quickly settled. This saves much time and anxiety and the useless re-opening of the abdomen in an unnecessary search. An ordinary glove-maker's foot or hand button stamper and the larger sizes of glove snap-buttons can be procured at a very small expenditure, and nothing more is necessary. A safety-pin can usually be seen but not as clearly in the depth of the pelvis. If the power of the apparatus is not strong enough to give sufficient penetration, a radiograph can be taken. By this latter procedure an additional advantage is obtained. When search is made, the operator is better able to verify the position of the lost pad, after the patient has been returned to the operating room, through reference to the plate. Eight to ten minutes in all is sufficient to take the radiograph and develop it if the dark room is nearby.

Radiograph of pelvis of a heavy boned six-footer showing a safety-pin, a hemostat, one large circular button, one star shaped rivet and a curved needle. These were not placed under the subject next to the plate nor within the pelvis but upon the surface of the abdomen so that the entire thickness of the belly and the dense pelvic bones had to be penetrated by the X-rays before making the shadow picture.

The nurses stamp each pad and sponge before doing them up for sterilization. This is so easily and rapidly accomplished as to add practically nothing to the labor of preparation.

Despite every effort to keep tally of pads and sponges, confusion too often arises and pads are lost or thought to be. To have a tape and hemostat fastened to each and to use a continuous string of gauze for swabbing, adds much to the labor of preparation and the annoyance of the operator and assistants. A stamped number on each pad or sponge is but little better than keeping a tally sheet, confusion in either case occurring in protracted and distressing operations. The above described device, however, saves all difficulty. This picture, it must be remembered, does not merely definitely determine the fact—of the pad being within the abdominal cavity—but also tells us where; thus obviating unnecessary disturbance of the entire abdominal contents during the search.

I would suggest that every operator arrange to have his x-ray apparatus placed sufficiently near to his operating room for convenient reference. Then, if also he is liable, as reports indicate some operators are, to drop hemostats, eye glasses, or other articles into his patients when excited and forget to remove them, he can save much subsequent expensive litigation, just by instituting, as a routine procedure, post-operative x-ray examination!

230 Clay Street.

**Sciatica.**—Patients suffering with sciatica should be examined carefully for a possible lesion of the pelvic bones, the vertebra or the spinal cord itself.—*Amer. Jour. of Surg.*



**Cocain Solutions not Injured by Boiling.**—Virden (*The American Journal of Surgery*, August, 1915) explodes the commonly accepted view that cocaine solutions are injured by boiling. He declares that in no case has he failed to secure the desired anesthesia with a small amount of the solution after boiling it. He also declares that there have been no undesirable effects, such as irritation of the cornea or conjunctiva, while the healing of surgical wounds has not in a way been interfered with. He is fully convinced that frequent or even prolonged boilings of solutions of cocaine hydrochlorate do not injure or destroy their anesthetic value, or make them any more dangerous to the tissues to which they are applied in ophthalmic surgery.

**Castor Oil in Surgery.**—Ganguli (*India Medical Gazette*, June, 1915) has had ample opportunity to try castor oil in the Indian Calvary Hospital upon injuries resulting from accidents of daily occurrence. The daily average number of cases so treated was never below ten. They comprised abrasions, bruises, and contusions, incised and lacerated wounds and burns and scalds. With the exception of a very few cases in which tincture of iodine was first used, all were uniformly treated simply with castor oil soaked in pieces of lint, applied to the part or parts injured, covered with cotton and bandaged with gutta percha tissue when available, to complete the dressing. The treatment was preceded by a thorough washing with a warm antiseptic lotion. Healing generally followed by first intention, sometimes by granulation or scabbing. In not a single case was there suppuration.

The advantages of this treatment are that it is cheap and always available; simple

and nonirritating. It can be applied in emergencies by the layman; it is anesthetic, while wounds, ulcers, etc., heal more promptly than with dry dressings or antiseptic solutions.

Gallant in the *United States Naval Bulletin* for July, 1915, declares that W. W. Van Arsdale in the *New York Medical Journal* of July, 1893, determined that castor oil to which 4 to 5 percent. of balsam of Peru had been added, made a dressing which when applied to fresh wounds prevents suppuration, absorption and infection, and acts quickly and efficiently as a drain while it promotes rapid healing. Van Arsdale's method of use was to spread the oil on a pad of plain or sterile gauze somewhat larger than the wound. He used a varnish brush with which to spread the oil on the gauze, the amount applied being graduated according to the period during which the dressing was to remain in place. Generally he used enough to permeate the first four or six layers of gauze, which was laid on the wound, so that the oil came in contact with it; this was covered with a layer of rubber tissue (paraffine paper) or oiled silk or muslin or oiled paper, and lastly a bandage. Gallant has used this dressing in many thousands of cases during six years and found it satisfactory for all sorts of granulating wounds, especially contused and lacerated ones as well as for burns, furuncles, incised abscesses, etc.

This dressing applied to fresh wounds by continuously absorbing all secretions, prevents bacterial proliferation and toxin formation; prevents pus accumulation and absorption; it precludes septic infection, as shown by absence of fever or local signs of any inflammation. Pain, redness and heat subside; drainage is free, the cavity contracted, healing rapidly taking place from the bottom of the wound.

Gallant summarizes the cases in the service of Dr. Van Arsdale from 1887 to 1896, reported in *Annals of Surgery*, September, 1897, as follows:

Wounds, 6,428; burns and scalds, 2,722; abscesses, 9,925; infections, 3,229; ulcers, 2,772; miscellaneous conditions, 3,944; in all 29,020 cases.

Eucalyptus oil may be used instead of the balsam of Peru; or the castor oil can be used alone.

**Sulphur in the Treatment of Scabies.—** Unna, (*Berliner Klemischer Wochenschrift*, No. 14, 1915) regards favorably Sherwell's treatment of scabies. When not complicated by eczema, powdered purified sulphur is rubbed into the infected areas. The patient is instructed to keep the sulphur beside him and whenever there is itching, he is at once, either day or night, to rub some of it over the itching parts rather than to scratch them. The results are as certain and less irritating than with more severe methods.

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**Relapse After the Use of Emetine in Amebic Dysentery.—** Barlow (*New York Medical Journal*, October 23, 1915), writes that he has kept card index histories of all cases of dysentery under treatment at a plantation in Honduras; and that these case histories were re-read after from eight to fourteen months following treatment. His conclusions are that about 80 percent. or more of the cases treated for entameba histolytica infection remained free from relapse for seven or more months if they had been treated for at least ten continuous days with not less than one grain daily of emetine. Those treated less than nine days almost surely relapsed. The simultaneous use of ipecac did not diminish the number of cases which relapsed, but the subsequent giving of ipecac diminished the number. Barlow declares a belief that a permanent cure is possible in a shorter time with emetine than with ipecac. He thinks it preferable to inject the daily dose at one time or in doses of not less than one grain of emetine.

The bowels should not be too frequently flushed. When there is marked diarrhea, opiates should be given in quantities to control it. This relieves the suffering of the patient, retains the emetine, thus hastening the cure and decreasing the prospect of recurrence or relapse.

Barlow advises frequent inspection of cases treated, monthly for at least six months, when cysts or vegetative forms of the ameba should be sought after a saline and immediately after stool has been passed. If either are found, another course of treatment with emetine should follow giving at

least one grain daily for nine days. The alternative is a continuous or intermittent use of ipecac for at least six months, or emetine daily for nine days.

#### Animal Charcoal for Infected Wounds.

—Knaffi-Lenz (*Münchener Medizin Wochenschrift*, November 18, 1915), reports using powdered animal charcoal in infected wounds and cavities at Eiselberg's clinic in Vienna and finding it most useful. Wounds were first rinsed with peroxide of hydrogen and then gently mopped with sterile gauze. Finely powdered animal charcoal was then blown over the wound until it was colored a deep black, when a dry dressing was applied. This was repeated every day, the charcoal being rinsed off each time, except in the most necrotic portions, to which it clings tenaciously. After a few days these portions can be lifted away with forceps. The author declares that old suppurating wounds heal more quickly with this than any other treatment. Deep penetrating wounds and infected cavities can be flushed out with a 2 to 3 percent. suspension, and this may apply to the plural space.

**Roasted Sawdust in the Treatment of Infected Wounds.**—Laugemak (*Centralblatt für Chirurgie*, November 23, 1915), is enthusiastic concerning the value of roasted sawdust in the treatment of infected wounds. He recommends a very fine sawdust roasted until it becomes somewhat dark in color. This combines the absorbent properties of sawdust with the antiseptic action of charcoal.

**Lime in the Treatment of Diabetes.**—M. and M. H. Kahn (*Medical Record*, October 30, 1915) report on the above in a number of experiments conducted on diabetic patients wherein they invariably found an increased calcium output, followed by a diminished amount of lime salt in the body. A similar increase of the calcium output has been noted in a variety of other complaints characterized by hyperglycemia. On this theory the writers studied the effect upon sugar excretion in diabetes when calcium salts were given with apparently satisfactory results.

The authors present one case, a middle aged woman, who was excreting on a standard diet, from 90 to 115 grams of sugar daily. When placed on the lime treatment, diet remaining the same, her glycosuria diminished in less than ten days to less than 10 grams per day. The glycemia ran a parallel course.

**Sterilization of the Skin with Tincture of Iodine.**—Stretton (*British Medical Journal*, May 22, 1915), reports never having seen any dermatitis following the use of iodine. He found an occasional limited amount of desquamation. Stretton declares that when applied to the unbroken skin there is no pain; on cut surfaces, however, there is a smarting or burning sensation which rapidly passes away. He also expresses himself as without fear in allowing the viscera in operative procedures to come into contact with the abdominal wall which has been painted with iodine. Such contact he regards preferable to that of sterile towels or gauze.

The author regards preliminary scrubbing and washing before the application of iodine not only unnecessary but positively harmful; and this opinion applies also to wet compresses used before operation. They both, he writes, cause swelling of the epithelial cells and prevent the iodine from penetrating to the deeper layers of the skin. It does not matter how unclean the skin; they may come from the workshop with dirt, sometimes black, but he thinks that skins which look clean may be more dangerous from a surgical point of view. If a bath is found desirable, it should be given twenty-four hours before the operation. It is not necessary he thinks, while in some instances it is a source of additional discomfort and anxiety.

Most surgeons continue to shave the hair from the field of operation, but our writer regards this as quite unnecessary. If it is done at all it should be dry shaved or the swelling of the epithelial cells above referred to will result. In head cases shaving should be done dry; in other situations it will be found quite sufficient to clip the hair away with scissors along the line of incision. And this should be done when the patient is under the influence of the anesthetic.

# RATIONAL ORGANOThERAPY

Conducted under the Editorial Direction of Dr. Henry R. Harrower.

**Are the Results from Organotherapy Due to Suggestion?**—In an article entitled "Animal Extracts in the Treatment of Medical Diseases," Graham Chambers of the University of Toronto (*Internat. Clinics*, 1915, Ser. xxv, Vol. ii, p. 50) devotes a dozen or more pages to a consideration of this rather large subject. In a summary of the possibilities of the treatment of diseases of the glands of internal secretion by animal extracts, Chambers is quite pessimistic, as the following excerpts indicate: "Extracts of the anterior lobe (pituitary) are ineffective. Pituitrin extracted from the posterior lobe is also ineffectual." "Extracts of the (suprarenal) gland are ineffective." "Thymus extract is without effect." "The (pineal) gland extracts are ineffectual." "Extracts of the pancreas have practically no effect." "Ovarian extracts are probably ineffective, although some physicians report favorable results." "Testicular extracts are ineffective."

We cannot believe that Mr. Chambers' paper is based upon a very extended clinical experience; and it seems unfortunate that such very definite statements have to be made in such an important periodical. At all events, others disagree, and so do we. Time will show that homostimulative organotherapy will be as effective in the treatment of functional insufficiencies of certain of the ductless glands, as is the empirical pharmacological action of some of these preparations in other varied conditions.

It was intended, however, briefly to consider Chambers' statements regarding the part that suggestion plays in organotherapy. After the well known and time tried remark that "at the present our knowledge of glandular secretions is so meagre that we have

very little to guide us in their administration," he continues: "The most memorable statement which has been made on the subject was that of Brown-Séquard, who, experimenting on himself, found that testicular extract had a most beneficial effect. Brown-Séquard was seventy-two years of age at the time, and, according to his statement, the drug produced a state of mental vigor which he had not experienced for some years. (Parenthetically, it is interesting to recall that he also found that he was able to do a good share of his work in the laboratories standing up. In fact his assistants were the first to notice that their director in his interest in certain experimental work, was standing and personally entering into the work, whereas for some years he had been unable to work save seated on a stool. So that there was a physical vigor which accompanied the mental vigor, referred to by Mr. Chambers.—Editor). At the time considerable credence was given to the statement. Later it was thought the effect was due to suggestion, which opinion is the one generally accepted at the present time.

"The question naturally arises in connection with this statement: 'What is the nature of suggestion? Is it possible that the extract did produce transient improvement, and this, by suggestion, led the way to a continuous betterment?' I am firmly convinced that this course frequently happens in the cure of disease. Anything which we can do by the exhibition of drugs, by the use of baths, or other remedial agent which tends to make the patient feel better, even for a few minutes, is frequently helpful. The patients who are continuously feeling miserable are very difficult to cure. Is it possible, therefore, that the exhibition of

an animal extract, such as that of the testes or ovaries, may be the means of starting the curative process in action?"

Mr. Chambers evidently believes that suggestion plays an important part in organo-therapeutic practice. Now we all know, and freely admit, that *confidence* (we prefer this term to "suggestion") is an undoubted factor in the treatment of many conditions; and when a patient has run the gamut of many forms of treatment, and finally is encouraged to believe that this "last resort" has a modicum of hope in it, the mental influence of such treatment is bound to be of some slight value. But one cannot surely credit suggestion with many of the clinical experimental facts that are on record in a hundred or more reports.

For example, to use an instance related to the facts referred to by Chambers: What mental factor is concerned in the establishment of secondary sex characteristics in castrated cocks, when they are given testicular substance for a short period? Or does suggestion appreciably influence the administration of the same extract when it is given to an individual with infantilism, without his knowledge of what the remedy is? Again: Can mental influences favorably regulate disturbed menstrual functions? If so, why does not this same factor accomplish the same results in connection with various other remedies which are usually given before corpus luteum or thyroid (or, preferably, both) are finally given "after trying almost everything else?"

In answer to the question which concludes that part of Mr. Chambers' remarks which are quoted above, we can only say "Yes, it is quite possible;" but this initiation of the curative action has much more to do with the principle of homostimulation—the stimulating hormone influence of extracts of a gland upon the activities of the organ corresponding to that from which the extract was prepared—than to suggestion, or even confidence.

Incidentally if some of our somewhat pessimistic colleagues would use a little suggestion and increase their confidence in organotherapy, they would not permit their names to be associated with such statements as "ovarian extracts are probably ineffective." In the meantime, however, we will continue to depend upon our oft-referred-to "tests-and-results" method.

### A New Development of Pituitary Therapeutics.

So far as we are aware, the first reference in medical literature to the use of a preparation of the pars intermedia of the pituitary body, was made by Haynes, of New York (*Am. Jour. Dis. Children*, November, 1915). He reports the study of an abnormal child during a period of two and a half years. At first the condition seemed to be a hypothyroidism; but it was later evident that the pituitary was involved and that the pars intermedia was more affected than either the anterior or posterior lobes.

The administration of dried pars intermedia improved the conditions present in several unexpected ways: For instance, symptoms which might rationally have been considered to be of thyroid origin, did not respond to thyroid therapy, but cleared up by the exhibition of pars intermedia substance. It had a remarkable effect upon the smoothness, texture, color and warmth of the skin. Its administration brought about striking changes in the contour of the hands, ankles, hips, shoulders and thighs, and that these changes were not accidental was demonstrated by the fact that these changes could be made to come or recede by giving or taking away the pars intermedia substance.

The same drawback to this new therapeutic procedure has militated against the extensive use of pineal extract in certain mental maldevelopments in children—the supply is so limited and the raw material so difficult and costly to gather, that the expense is almost prohibitive. Haynes' experience is of unusual interest in that it is the first of its kind, and because it shows that the pituitary is divided into at least three distinctly active parts, all of which can be made to bring about physiological changes by their administration as drugs. Doubtless there will be more work done in this direction and it may be that this will unfold still further some of the mysteries of the hormone balance as well as the relation of organotherapy to developmental disorders.

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**Why is Thyroid Sometimes Useful in Goiter?**—This question has been put to the writer several times, and most querists seem to have had the idea that goiter was a

condition of increased thyroid activity, a not unnatural deduction from the fact that hyperplasia is the chief feature of such cases. Now, in Graves's disease there is obviously an increased activity of the gland and during the active hyperthyroid manifestations in such cases, thyroid medication would be clearly contraindicated, although some writers, notably Leonard Williams of London, have found benefit from this drug in the late stages of exophthalmic goiter, where the exhaustion has extended even to the activities of the thyroid gland itself.

In simple goiter, however, especially in the form which occurs in girls at puberty or early adolescence, it is very valuable when given in doses of about one-half a grain three or four times a day for a week or ten days, then discontinued for an equal period and begun again in like dose for another similar time, and so forth.

From a histological standpoint simple goiter more often shows an enlargement of the acini of the gland rather than of the actual cellular structure, and the acini are usually filled with a colloid material. This does not favor the maintenance of the normal secretory action and there is a virtual hypothyroidism in many cases of this character. A concise explanation of the influence of thyroid extract in simple goiter was given in a paper by Graham Chambers (*Int. Clinics*, 1915, vol. ii, p. 62) : "In explaining the action of the drug in simple goiter one must take for granted—which I think is generally accepted—that the percentage of iodine in the active principle of the thyroid is variable, and that the more iodine present the greater the physiologic activity of the gland. If the thyroid is poor in iodine, then hypertrophy of the glandular tissue ensues, in order to render the secretion functionally efficient. A patient, therefore, with simple goiter has an excessive quantity of low-grade active principle. If one administers an extract of the thyroid of the sheep to such a patient, then the grade of the active principle is raised, and the hyperplasia of the glandular tissue undergoes atrophy, and the goiter diminishes in size."

In some cases this influence is just as satisfactorily brought about by iodine in inorganic combination or pure, and this explains the good results that have been reported of the local application of iodine or

iodides, or iodine cataphoresis in simple goiter.

**Two "Futurist" Remedies.**—In a recent issue of AMERICAN MEDICINE, there appeared a short article in this department on the therapeutic possibilities of hepatic substance. Since its preparation our attention has been called to an item in the *California State Journal of Medicine*, (November, 1915, p. 419) entitled "Extract of Liver, a Futurist Remedy." In this brief note, which is really directed against a French proprietary whose claims of virtue are rather extravagant, the editor remarks: "We wonder if a cat's fondness for liver has any relation to its proverbial 'seven lives.'"

Probably the statements of this writer are limited by his knowledge of the subject. Doubtless he has not read of the work of Gilbert, Carnot and others; and of course, his view point is probably distorted by the feelings of disgust against the methods of the nostrum maker. But hepatic extract undoubtedly exerts a therapeutic influence and it has been, and may yet be, used to control certain hemorrhages (especially of a constitutional character) and to favor the restoration of deranged hepatic function.

We are reminded by this trite reference to the cat and its fondness for liver, of another recent article in which a therapeutic procedure is based on the cat's propensity for devouring the placenta. The fact that this article is by one of Chicago's most prominent women physicians; and that it is not merely a suggestive statement but an actual report of a number of clinical experiences, makes us feel more comfortable about referring to another such "futurist remedy" as desiccated placenta.

**Clinical Experiences with Desiccated Placenta.**—Basing her ideas on the observation that domestic animals devour the placenta immediately on its appearance, Bertha Van Hoosen (*Woman's Medical Journal*, December, 1915, xxv, p. 269) makes a preliminary report of the administration of desiccated placenta substance to a series of nursing mothers. The report is made "hoping that others will add to our

scant knowledge of organ therapy and that infant feeding may become simplified by the infants having a sufficient supply of breast milk."

Van Hoosen gave from 30 to 50 grains of desiccated bovine placenta in divided doses during the first twelve hours after parturition. The first report was in the form of a complaint by the nurses that the mothers had so much milk that "it was a burden to keep the breasts empty." Some figures are interesting here. In one day six mothers nursed their babies, allowing them to take all they would, and a total of 44 ounces of surplus milk had to be removed by the breast pump. In one case there was 16 ozs. extra, in three others 6 ozs. each; a fifth 8 ozs. and the remaining one 4 ozs.

Extended tables of the weights are given in the above paper and comparisons are made from which it is reasonable to deduce that this comparatively untried method increases the quantity and quality of the milk, and hence favors the reduction of the usual average loss of weight during the first days of life and increases the infant's later gain in weight as compared with carefully made figures from controls. No other results were noted from the administration of the desiccated placenta except the early and gradual stimulation of the secretion of milk.

This is up-to-date confirmation *at home* of numerous reports in French and continental medical literature to the effect that dried placenta is one of the most effective galactagogues known; and, if we are to judge from our knowledge of the habits of animals, its use seems rational.

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cluding postoperative paresis, obstipation and the most chronic forms of intestinal stasis. It is usually given by intravenous injection and several fatal results are recorded which were said to be due to foreign proteins in the solution which, it is understood have been removed thus overcoming the previously made objections against it.

The war has not facilitated the production or exportation of hormonal and there is enough evidence on record to warrant us in believing that the extract of the posterior lobe of the pituitary—the same remedy which is so useful in obstetrics and other conditions—is equally effective in its action in most cases where hormonal might be used, is more easily obtained and administered, is much cheaper and has none of the dangers. In addition its action is not limited to the desired influence on the bowel, but it is at the same time a cardiac tonic, a diuretic and general excitant of unstriped muscle.

A very interesting case was brought to the writer's attention in which pituitary was used in persistent obstipation. A neurotic girl with epileptic antecedents and a history of several "spells" had been permitted to become seriously obstipated and when seen she had not had a movement of the bowels for twenty-one days. Most of the usual and some unusual procedures had been tried, but with no more results than the passage of flatus. One or more injections of pituitary liquid were recommended and one-half a cubic centimeter was injected as usual and repeated some hours later. Within three hours of the first injection presentiments of an approaching stool were noticed, and shortly after the second injection the patient had several copious movements, much to the surprise and relief of those in charge of the case.

More recently, the writer has had another similarly interesting experience. A business man, aged 60, had for some time been suffering with a chronic intestinal disturbance which was complicated by several large hemorrhoids which bled freely and frequently. He allowed himself to become quite badly obstipated and about thirty hours before he was seen in consultation, he had taken two grains of calomel. The next morning he took a bottle of citrate of magnesia with no effect; several hours later he took another bottle. He was now

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**Pituitary Superseding Hormonal as an Enterokinetic.**—Some years ago a very extended literature was published on the use of hormonal, an extract of the spleen discovered by Zuelzer of Berlin, the principal therapeutic action of which was a remarkably direct and vigorous influence upon the intestinal musculature. Hormonal has been given in many hospitals and clinics in Germany and elsewhere and many case reports are on record which show its decided efficacy. It has been used in the severest forms of intestinal obstruction, in-

suffering considerably from distension and abdominal pain and was given rectal injections which only gave slight relief. He then took four ounces of castor oil and was found in a most uncomfortable and restless condition, abdomen much distended and somewhat tender. There were no prospects of a movement from the previous medication and he was given  $\frac{1}{2}$  cc. of pituitrin with 5 cc. of distilled water into the median basilic vein. Within a few minutes he began to notice abdominal movements and within 30 minutes was called to the stool, the same evening having altogether five fluid passages with much gas.

Two other points are worth mentioning: The blood pressure in this case was 190 mm. and was not influenced by the injection; and the preparation used was stale, there being little more than a dram in a g. s. bottle, the date on which had expired over six months before.

**Thyroid Medication in Acne.**—The thyroid gland has been definitely connected with a number of skin disorders and its possible relationship to acne vulgaris has recently been considered. It also has been quite conclusively shown that the thyroid exerts a control over the factors which regulate the immunity producing mechanism. Sajous and a number of French investigators have done much experimental work to establish this relation. It has also been remarked that infections of different varieties may in some way be connected with thyroid activity.

It seems that there is a direct relation between the incidence of certain cases of acne and the function of the thyroid, especially in young girls, and women in whom, it will be remembered, acne is particularly frequent. If this relationship is established, there should be a chance of benefiting acne with thyroid treatment in a number of cases, and the empirical administration of this remedy would be likely to emphasize the above suggestions, or not, as the case may be.

Chambers in a pessimistic paper on the use of animal extracts in internal medicine (*Int. Clinics*, 1915, ii, p. 50) speaks quite favorably of his experience with thyroid extract in acne. In explanation, he reminds

us that patients suffering from myxedema are very susceptible to infection; and that it is stated that the administration of thyroid raises the opsonic index and the phagocytic properties of the leucocytes. These observations suggest the use of thyroid in certain chronic infectious diseases. Chambers then continues: "I have frequently exhibited thyroid extract in the treatment of acne vulgaris. It will be remembered that acne and simple goiter are prone to occur at puberty. Is it possible, therefore, that there is a relationship between them as regards etiology? This suggested to me that such is possible and led me to make use of it in the treatment of acne. In some cases it has, I think, undoubtedly favorable influence."

The list of affections in which thyroid may be used with prospects of success, is continually increasing; and there seem to be very good reasons for adding it to our present treatment of acne vulgaris, especially in young persons.

**Adrenalin in the Diagnosis of Dementia Precox.**—An editorial writer in the *Lancet-Clinic* (July 31, 1915) directs attention to the instillation of adrenalin solution as a diagnostic test for dementia precox. In the majority of healthy persons the instillation of one or two drops of a 1:1000 adrenalin chloride solution causes no mydriasis even if repeated several times at intervals of a few minutes. In undoubtedly cases of dementia precox, however, mydriasis will follow the application of this test, after about ten minutes and will persist for 30 minutes or more. Like many tests it is not absolute; but where there is a question as to the exact diagnosis, the presence of this manifestation would favor the more serious prognosis. It should be remembered that the same instillation into the conjunctival sac of an individual suspected to have diabetes, will cause mydriasis in positive cases as recorded by Loewi, so this disease must be ruled out.

**Brain Substance (Cephalin) as a Hemostatic.**—As a result of the suggestion by Howell that fibrin ferment—the essential

factor in the coagulation of blood—was not a ferment but of a lipoid nature, Hirschfelder (*Lancet*, September 4, 1915) has made a number of tests with lipoid substances from the brain and other organs to see if they exerted a hemostatic action.

The lipoid-like diphosphatide usually called cephalin or kephalin, was prepared by extraction with ether. The technique was as follows: Minced ox brain was covered with three times its volume of alcohol, shaken, allowed to stand and the supernatant alcohol decanted. The residue was then mixed with ether, shaken, filtered and the filtrate slowly evaporated to dryness. The yellow residue is principally cephalin.

This fatty substance was smeared over a bleeding area and in from one to two minutes a firm clot was produced. Hirschfelder recommends this as an excellent and inexpensive hemostatic and recommends its use in military and civil practice.

## PRACTICAL POINTS.

**Pituitary Liquid** may be boiled, if desired before injection; but it must not be given in a syringe which has just been rinsed in alcohol.

**Meteorism.**—A single injection of pituitary controls meteorism very effectively. It should not be used in typhoid fever, however.

**Adjunct Treatment in Chorea.**—It is believed that the manifestations of chorea can be materially reduced by removing the tonsils, especially when they are hypertrophied and infiltrated.

**Thyroid in Hypertension.**—In certain cases of hypertension, especially in obese persons, thyroid 1 grain three times a day, may reduce the pressure as nothing else. It should be used cautiously.

**Hyperpituitarism.**—Certain cases of hyperpituitarism are benefited by administering the opposite organoatherapeutic extract which, according to Ludlum and Corson-White, is orchitic extract.

**Nocturnal Enuresis.**—Add half a grain of thyroid (three times a day) to the usual treatment of refractory cases of bedwetting. It has been recommended as a successful remedy with no other associated drug treatment.

**Red Bone Marrow** is still a valuable stimulant of the hematopoietic organs. Since its introduction into medicine other remedies have been highly recommended in anemic conditions, but bone medulla remains a convenient and effective remedy.

**Placenta Previa.**—The hemorrhage of placenta previa is often rapidly controlled by injecting pituitary extract. In such cases the degree of dilatation of the os cannot always be as great as caution demands in normal circumstances. One-half a cubic centimeter is a full dose.

**Influence of the Pituitary on Salivary Secretion.**—The physiology of the ductless glands occasionally seems to be quite contradictory. For instance the hypophysis is known to exert a decidedly stimulating influence upon renal secretion and frequent therapeutic advantage is being gained from this fact. The posterior lobe of the hypophysis also causes a remarkable increase in the flow of milk and this also has been used to good effect in nursing mothers with a limited supply of milk and in caked breast where the flow of milk is not good.

Now comes a report from two South Dakota physicians (Solem and Lommel, *Amer. Jour. Physiol.*, September, 1915) to the effect that pituitary extract invariably caused a diminution in the flow of blood in the submaxillary gland as well as in the production of saliva. In a series of 30 dogs and 1 cat the decrease in the flow of saliva was greater than the accompanying decrease in the flow of blood through the glands. While no therapeutic application of this is suggested it is possible that this influence of pituitary upon salivary secretion later may be brought to bear in cases where drooling and salivary superactivity is present.

# THE ANNOTATOR



## The Relation of Good Roads to Health.

Sometime ago it would have been difficult to convince even the most intelligent layman that there is any relation between good roads and the prevention of disease. He would have scoffed at the idea and looked on it as only another faddistic view of the sanitarian. With the rapid education of the public

in regard to the manifold causes of disease, however, little or no surprise will be aroused by the bulletin issued by the State Board of Health of Kansas in which it is declared that good roads contribute directly to the preservation of good health. As immediate substantiation of this it is shown how the thorough removal of weeds and trash by hastening the evaporation of pools of stagnant water promptly removes countless breeding places for mosquitoes, flies and other disease carriers.

Therefore, good clean roads, well drained by open ditches, kept clear of weeds, brush and debris, and with hardened surface from which horse manure is regularly removed—not merely swept to one side—promote the health of the community in no uncertain way. Whenever conditions will permit, roads should be oiled at proper intervals during the dry season, for the oil is not only destructive of all insect larvae, especially those of mosquitoes and house flies, but also prevents dust; as a matter of fact the expense is trifling in comparison with the beneficial influence on the health of those who live on and use roads thus cared for, to say nothing of the effect on all vegetation including crops, garden and lawn vegetation and foliage of all kinds. A dry road offers pedestrians dry shoes and warm

feet, notably children when going to and from school. It must be evident, therefore, that while good roads are in all respects good financial and commercial investments, they also fill an important place in the prophylaxis of disease and the promotion of public health.

## The Need for More Careful Supervision of Public Laundries.

The importance of the laundry as a sanitary institution can hardly be over estimated, and, it goes without saying, its operations should always be conducted under the most sanitary conditions.

This, as a rule, can be fairly well managed in the case of the large power laundries, which possess special facilities for sterilization, but where the work is done by hand, the equipment is often far from satisfactory from a sanitary standpoint.

When linen is sent to a power laundry, the risk of its becoming infected is comparatively small. Clothing passing through such an establishment undergoes treatment that may reasonably be expected to render it sterile, after which it goes to suitable rooms for ironing and packing. It is an axiom, or should be, of good laundry practice, that linen after it is cleaned should never come in contact with—or even into the neighborhood of—soiled linen in its further passage through the laundry. In well equipped hand laundries these requirements may all be fulfilled, but in many of the smaller institutions the conditions are apt to be anything but satisfactory.

It is apparent, therefore, that the ques-

tion of laundry efficiency, especially in connection with the small ordinarily equipped laundry, is of much more importance from a health standpoint than is generally appreciated. One need give the matter only the most casual thought to realize how great a menace the carelessly conducted laundry may be.

In this connection it is interesting to note that over eleven years ago Dr. Ira S. Wile discussed in the *Medical News* (Dec. 3, 1904) this problem of laundry hygiene. While the state of affairs referred to in his paper at that time may since have much improved, it may be taken for granted that many of the evils pointed out by him still remain the same. Dr. Wile went into the matter at some length, and among other references made mention of some statements contained in an article in the *British Medical Journal* a year or so before pertaining to laundry conditions, and the desirability of correcting them.

In practically every laundry a considerable quantity of handkerchiefs, pillow cases, etc., which have been soiled with tuberculous expectoration and discharge without any attempt at disinfection, must be received from time to time, and the task of washing and sorting such articles is obviously attended with more or less danger to those upon whom these duties devolve, especially as the sorting room is usually one of the worst ventilated rooms in the whole laundry. The sorting room, moreover, becomes a source of danger to those working in other departments, as it is in this room that many of the workers of the establishment often eat their lunches. In a recent issue of *American Journal of Public Health*, (Sept., 1915), Dr. Ebba Almgren Dederer dealt with a report made a short time previously, on the sanitary condition of laundries. He pointed out in the course of his paper that the possibility of the dissemination of disease through laundries may be attributable to the fact that bed and body linen of different individuals are washed together. At any rate, inasmuch as soiled body linen is known to harbor all manner of infectious organisms discharged from the host, are we not justified in considering the manipulation of soiled linen as a very probable factor in the transmission of infectious diseases? It is

not difficult to see how the pathogenic organisms in soiled linen may lead to direct infection of the workers who handle the linen as it is received—and through them indirectly all those with whom they come in contact.

There are three modes of infection, inhalation, inoculation through wounds or touching the face and eyes, and ingestion through wetting the fingers in counting the clothes, or by food contamination at lunch time.

The diseases most likely to be spread by these means are typhoid fever, scarlet fever, measles, whooping cough, and smallpox, and of these smallpox and scarlet fever seem to be the most infectious and persistent.

As for the relation of phthisis to laundry work, this adds several different aspects to the situation. The statistics on this phase of the question are even less to be depended upon than statistics generally. According to Oliver, however, the death rate of laundry workers from tuberculosis is high and if this be so, this fact can be very logically attributed to the special conditions incidental to work in laundries.

There can hardly be any question, therefore, if our public laundries are not conducted with a strict regard to the principles of modern hygiene in every minute particular, that they are bound to be a menace to the public health. In cities as fortunate as New York, for instance, in which the Board of Health is zealous and avid for the health of its citizens, the dangers from public laundries are reduced to a minimum. In too many American cities these gratifying conditions do not obtain, and in view of the facts and figures that have been brought forward, it can hardly be denied that the great majority of our public laundries need more careful supervision by the local health authorities. The laundry, properly equipped and properly conducted, is one of the most important forces in the scheme of public sanitation—as well as that of personal hygiene. To keep it at its highest efficiency is one of the first duties of health officials, therefore, not alone to safeguard those who are forced to undergo the special hazards of laundry work, but also to protect the health of those who are obliged to depend on the public laundry for the maintenance of personal cleanliness.

**The Bladder and Kidneys.**—In no field of medicine says an editorial writer in the *Medical Herald* (Nov., 1915) has there been such satisfactory progress as in the diagnosis and treatment of conditions of the bladder and kidneys.

The invention and perfecting of the cystoscope was the stepping stone to this progress and certainly no instrument except the microscope and x-ray machine has proven more accurate and genuinely useful. This instrument led of course to direct application of therapeutic measures to the wall of the bladder; and it led to ureteral catheterization and to more certain diagnosis and treatment of kidney lesions.

Among the general facts which have been brought out in recent studies is that infection ascending from the bladder is very rare. It has been found that the openings between ureters and bladder are so well protected from return flow, that even in a bladder chronically inflamed and distended, it was impossible at autopsy to force fluid from the bladder through these orifices and into the ureters.

The diagnosis of tubercular kidney has, through the examination of the urine for the bacilli, and by ureteral comparison of the condition of the kidneys, been rendered comparatively easy, and the result of surgical treatment has been most satisfactory even where both kidneys were (though not equally) diseased. The distressing bladder symptoms, which accompany tuberculosis of the kidney (and which have never been explained) promptly disappear and the patient takes on a new lease of life.

It is to be hoped that the general practitioner, who can hardly be expected to be skilled in the use of the cystoscope, will appreciate the great diagnostic importance of this instrument which in skilled hands examines lesions face to face, which must otherwise be seen most darkly through the eye of the best trained scientific imagination.

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**Chronic Intestinal Stasis.**—Bassler (*N. Y. Med. Jour.*, November 6, 1915) gives the following clinical picture of chronic intestinal stasis:

1. Attacks of abdominal distress situated anywhere in the abdomen, generally in the epigastrum or right iliac region, these not being associated with the taking of food.

2. Local tenderness in two areas—that of the right iliac region and the region of the hepatic flexure. The point of maximum tender-

ness is usually somewhat below and internal to the point of greatest tenderness in appendicitis—that is, the lower ileum or the caput caeci.

3. Constipation, a marked feature in the majority of cases, which may be preceded by attacks of abdominal pain and perhaps alternates with diarrhea and output of mucus.

4. A sensation of distention by gas, limited to the right side of the abdomen, perhaps causing a palpable cecum, and one in which splashing can be elicited.

5. Symptoms of intestinal intoxication, such as a feeling of general ill being, lack of energy and endurance, headache, backache, and loss of appetite. The skin may be sallow, the complexion muddy with rings beneath the eyes, the flexures of the armpits, groin, and popliteal regions may be stained, and the breath may be offensive. There are various neurasthenic symptoms, both local in the abdomen and general in the body, considerable loss in weight or inability to add weight whatever the diet and the routine of life may be.

6. Various eye symptoms of a functional type, diminution or exaggeration of both superficial and deep reflexes, insomnia of a neurotic type, slow or fast heart's action, symptoms of distress apparently in the urethra which are without visible local cause, coccygodynia, subjective pains in the left hip, flank, and subscapular region.

7. Prolonged stoppage of bismuth at certain points in the intestinal canal, as shown by x-ray examination after a bismuth meal. While this is sufficient to enable many to make or confirm the presence of intestinal stasis, to me it is often fallacious. General dependence upon this one method of examination is very likely to lead one astray. It is a method of examination that should be tried, but never depended upon absolutely. Reasons for this are given later.

8. Careful examination of stool and a twenty-four hour specimen of urine collected under known conditions of diet, suitable for the age, weight, and work of the individual, permitting long enough time on the diet so that specimens obtained represent the foods taken. The examination of these, showing in the urine evidences of slight kidney irritation and perhaps an indefinite reaction to either Fehling's or Benedict's solution, a high sulphate partition in which the ethereal sulphates represent a greater proportion than one to ten to the preformed, high phosphorous output, and the presence or not (according to the type of toxemia) of indican, uroosein, and faint traces of urobilin. In the examination of the feces—feces and water test—a low gas content in the indolic and a high gas content in the saccharobutyric; and in the culture tests, a high gas content in the indolic and a low gas content in the saccharobutyric, a strong alkalinity or acidity of the stool, a very dark or light color, the presence of bacteria abnormal either in the number of Gram negatives or Gram positives and the individual study of both types of organisms, this matter being studied from Gram differentially stained stools, and sedimentary

fields of culture media. In my opinion these last examinations are the most valuable methods of diagnosing chronic intestinal stasis.

**Important Points in the Diagnosis of Gastric Ulcer.**—Dr. Robt. Tissot, Switzerland (*Med. Brief*, December, 1915) discusses the diagnosis of gastric ulcer and points out first of all that the gastric juice is nearly always hyperacid. Is this hyperchlorhydria the cause or a consequence of the ulcer? At the present time the majority of clinicians hold that the ulcer is the cause of the hypersecretion. It is evident that an ulcer which irritates the stomach incites it to secrete; but it is well known, also, that in epilepsy and psychic disturbance there is a hypersecretion which replaces the crisis of grand-mal, or the psychic paroxysm, this being capable of complicating itself with ulcer. One thing is certain, namely, that the ulcer is a cause of hyperchlorhydria and that the latter condition may favor ulceration and possibly even provoke it.

Pain is the most positive symptom of ulcer of the stomach. It appears in the epigastric region after eating. It is provoked by digital pressure over a limited area of the epigastrium. Moreover, the farther the ulcer is situated from the cardia and the nearer to the pylorus, the later the pain will set in. Its intensity depends upon the quality of food ingested. The more solid and acid the food, the more acute is the pain. The periodicity of the pain also is typical. During some weeks the patient suffers severely after meals. Then there follow months of total calm. Menstruation also exercises some influence; a large menstrual flow diminishes the pain, while a small one increases it.

**Stagnation** (determined microscopically) twelve hours after a test meal and the presence of sanguina and foam render probable the existence of an ulcer or cancer, but in the latter case numerous bacteria will be found present. The presence of retained contents of the stomach upon arising in the morning, together with free hydrochloric acid, should make one think of ulcer. Continuous hypersecretion lends probability to the diagnosis of ulcer.

Ulcer of the duodenum can not be distinguished, clinically or therapeutically, from gastric ulcer.

ied the subject, that the principal organism in this intractable condition is the *coccobacillus fetidus ozaenae* of Perez.

Horn has prepared a stock vaccine from six strains of this organism isolated in this country and finds that injections of it constitute "the most practical method of treatment now available." It is well to add that this writer also suggests that in most cases it is well "to precede or combine with the treatment vaccines made from the organisms which are usually present in combination with the Perez bacillus."

**Bacterins in the Treatment of Typhoid.**—Since Watters of Boston, first recommended the therapeutic use of stock typhoid bacterins in the treatment of typhoid fever, some five years ago, many contradictory statements have appeared on this matter. A recent paper by Wiltshire and MacGillicuddy (*Lancet*, Sept. 25, 1915) records their experiences with fifty cases and the results thoroughly confirm Watters' original conclusions.

Most cases treated with this stock typhoid bacterin required only two injections, the initial injection being 250,000,000 and the second half as much again. When three or more injections seemed advisable, the third injection consisted of 500,000,000 and subsequent injections were increased 250,000,000 each time.

Of the fifty cases treated by these writers, 32 were decidedly benefited, 24 of whom progressed after the first or second dose to complete recovery. Twelve of the whole series did not seem to be influenced by the bacterin, but in only five of these could the treatment be given a thorough trial. In six cases there was evident harm from the injections, in three there were complications which hindered and in the remaining three the injections were repeated too soon (at 48-hour intervals) and as a result the pulse and temperature were somewhat increased.

Wiltshire and MacGillicuddy prefer to administer the bacterin at intervals of three days, the chief guide to the initial dose and its subsequent gradation being the temperature curve.

**Increasing Phagocytosis with Magnesium Chloride.**—Delbet (*Bull. Acad. Med. Paris*, Sept. 7, 1915) and later Rosenblith (*Ibid.* Sept. 28, 1915) both speak favorably of the "cytophylactic" power of a 1.2 percent solution of anhydrous magnesium chloride. Experimentally Delbet injected as much as 150 cc. into the veins of dogs with a remarkable increase in the opsonic powers of the leucocytes. The principal therapeutic use of this solution made by Delbet has been as a local application to wounds. Rosenblith, on the other hand, has given it in subcutaneous injections and has incidentally noted benefit from its administration in a concomitant arthritis. He has proved that the local use of this solution increases the opsonic index and materially facilitates the generation of those substances which are antagonistic to the proliferation of bacteria.

## TREATMENT

**Stock Vaccines in Ozena (Atrophic Rhinitis.)**—Henry Horn of San Francisco, (*Journal A. M. A.*, Aug. 28, 1915) gives an impetus to the study of the bacteriology of ozena and reports that it is now conceded by those who have stud-



**Rules for the Care and Feeding of Cancer Patients.**—The following are the routine directions laid down at the New York Skin and Cancer Hospital for the systematic care and feeding of cancer patients:

1. Cancer is a serious disease which should receive constant medical care from the time it is first suspected.
2. "Cancer Specialists," who advertise, should be avoided.
3. Cancer is not contagious, and there is no danger of communicating the disease to others.
4. Cancer is not a disgraceful disease, and there is no reason for being ashamed of it or hiding it.
5. As soon as cancer is suspected, whether there be a lump, or sore, or other symptoms, it should be at once cared for by a competent medical man, as the earlier it is treated the more prospect there is of its being cured.
6. Anything suspected to be cancer should not be handled or squeezed, but should be kept from all irritation, as all this spreads the trouble and renders the cure more difficult.
7. When it is decided that a surgical operation is necessary this should be done completely at the earliest possible moment; delay is dangerous.
8. The proper medical treatment of cancer should never be neglected, both at the very beginning, and also after an operation has been performed.
9. It is not necessary to operate on every cancer, x-ray and radium are often of value, and the disease may disappear and remain absent under proper dietetic and medical treatment.

10. This treatment consists in an absolutely vegetarian diet, with continuous proper medication, for a long time.

11. To get favorable results this treatment should be kept up strictly until discontinued by the physician.

To assist in carrying out a strictly vegetarian diet, a diet list for cancer is here given, which should be closely adhered to. Coffee, chocolate and cocoa, as also alcoholic drinks, even beer, are harmful and must be avoided. The rules given at the end are also to be strictly observed.

#### DIET FOR CANCER.

##### FIRST DAY.

**Breakfast.**—4 ounces rice, 3 ounces corn bread, 1½ ounces butter, ½ ounce sugar, hot water.

**Dinner.**—5 ounces vegetable soup, 3 ounces baked potatoes, 3 ounces stewed celery, 1 ounce graham bread, 1½ ounces butter, 1 fresh apple.

**Supper.**—4 ounces rolled oats, 2 ounces white bread, 1¼ ounces butter, 4 ounces stewed

prunes, ¼ ounce sugar, very weak tea.

##### SECOND DAY.

**Breakfast.**—Orange, 4 ounces hominy, 2 ounces graham toast, 1¼ ounces butter, ½ ounce sugar, postum.

**Dinner.**—5 ounces pea soup, 3 ounces macaroni, 3 ounces string beans, 3 ounces carrots, 2 ounces bread, 1¼ ounces butter, dates.

**Supper.**—4 ounces cream of wheat, 2 ounces graham toast, 1¼ ounces baked apple, 2 ounces crackers, 1¼ ounces butter, ¼ ounce sugar, very weak tea.

##### THIRD DAY.

**Breakfast.**—Banana, 4 ounces pettijohn, 2 ounces white bread, 1¼ ounces butter, ½ ounce sugar, hot water.

**Dinner.**—5 ounces corn soup, 3 ounces baked potatoes, 3 ounces spinach, 3 ounces boiled onions, 2 ounces bread, 1¼ ounces butter, raisins.

**Supper.**—4 ounces farina, 4 ounces stewed figs, 2 ounces graham crackers, 1½ ounces butter, ¼ ounce sugar, very weak tea.

##### FOURTH DAY.

**Breakfast.**—Raw apple, 4 ounces cornmeal mush, 2 ounces graham bread, 1¼ ounces butter, ½ ounce sugar, postum.

**Dinner.**—5 ounces vegetable soup, 4 ounces baked beans, 3 ounces cauliflower, 3 ounces asparagus, 2 ounces bread, ¼ ounce butter, orange.

**Supper.**—4 ounces rice, 4 ounces stewed prunes, 2 ounces graham crackers, 1¼ ounces butter, ¼ ounce sugar, very weak tea.

##### FIFTH DAY.

**Breakfast.**—Orange, 4 ounces cracked wheat, 3 ounces corn muffins, 1¼ ounces butter, ½ ounce sugar, hot water.

**Dinner.**—5 ounces sago soup, 4 ounces spaghetti, 3 ounces Lima beans, 3 ounces boiled onions, 1¼ ounces butter, dates.

**Supper.**—4 ounces cream of wheat, sliced orange, 2 ounces oatmeal crackers, 1¼ ounces butter, ¼ ounce sugar, very weak tea.

##### SIXTH DAY.

**Breakfast.**—4 ounces samp, 2 ounces graham toast, 1¼ ounces butter, ½ ounce sugar, postum.

**Dinner.**—5 ounces celery soup, 4 ounces baked potatoes, 3 ounces carrots, 3 ounces spinach, 1¼ ounces butter, 2 ounces bread, figs.

**Supper.**—4 ounces wheatena, 4 ounces stewed figs, 2 ounces Uneeda biscuit, 1¼ ounces butter, ¼ ounce sugar, very weak tea.

Repeat this bill of fare on successive days. Some interchange of the different articles may be made, to suit the appetite or convenience of patients; but in the main this bill of fare should be followed.

Bread at least 24 hours old may be taken as desired.

A little old cheese may be grated on the macaroni and spaghetti, but not cooked with it.

One boiled or poached egg may be taken for breakfast every other day, and very fat bacon on the alternate days, unless otherwise directed by the physician.

It is desirable to eat the skin of potatoes.

Each and every meal should be eaten very slowly, for half an hour, with long chewing.

One tumbler of water is to be taken with each meal, but not when food is in the mouth; also a tumbler full of hot water, one hour before breakfast and supper.

No milk is to be taken unless specially ordered.

The cereals are to be boiled with water, three or four hours, and may be cooked in the afternoon and heated in the morning, adding more water. Rice, farina, and cream of wheat require only an hour. Chopped dates, figs, raisins, or currants may be added to cereals when desired.

All the cereals are to be served very hot, on hot plates, and eaten with butter and salt to taste (not milk and sugar). They are to be eaten very slowly with a fork, and very well chewed.

The crackers with supper may be varied to suit the taste; they should be eaten dry, with butter, and chewed very thoroughly.

Nothing should be taken between meals, unless especially directed, and the life should be as simple and healthful as possible, with early and long bed hours.

**Breast Feeding.**—Waller points out the need for correlation between (1) the periodicity in the secretion of milk, (2) the size of the meals, and (3) the infant's appetite (*Jour. Obst. and Gyn. Brit. Emp.*, 1915, xxvii, 74). Efforts to control the flow of milk which do not take into account the periodic character of its secretion are likely for the most part to end in failure. For the establishment of lactation all that seems necessary is the regular stimulation of suckling with a sufficient interval between the infant's meals. If this be observed the woman will become aware of a sensation which is variously described as a rushing, tearing, or painful stabbing in the breasts, known as the "draught" and experienced as soon as the child's mouth is applied to the nipple. In some the breasts can be observed to swell and become tense where a few moments earlier they were flaccid and apparently empty. In cases where the periodicity is firmly established the engorgement may even occur at the appointed time without the breast being stimulated by sucking; the flow lasts for a few minutes and then ceases. Maintenance of the "draught" throughout the course of lactation is perhaps the surest sign that breast feeding has been normally carried out, and this is reflected in the almost invariable progress of the infants so fed. Conversely, in all cases where a child has taken the breast for a few weeks and the "draught" is only felt occasionally or not at all, suspicion should be roused that the régime is not satisfactory. Until this is regulated to meet the physiological requirements of the gland, the opinion should be withheld that successful breast feeding is not feasible. Too frequent sucking is the commonest cause of impoverishment of the milk. The custom of urging women to feed their infants at two-hourly intervals nine or ten times during the twenty-four hours is responsible for weaning in an enormous number of cases. A month is about the limit of

time for which a woman can endure the two-hourly imposition. To obtain the maximum output of work a suitable stimulus must be applied at a suitable interval. In some hundreds of cases where test meals have been taken their size has been found to increase as the frequency of the administration has fallen. Further, it has been found over and over again that the total quantity in twenty-four hours is greater when the number of meals given is six rather than nine or ten, and greater still when the six give place to five and four. In one of the writer's observations he shows that a child can take 7 ounces of food from the breasts at one meal as early as the twenty-first day.

**Protein as a Dietary in Blood-pressure.**—Soper (*Interstate Medical Journal*, November, 1915), arrives at the following conclusions in an article on the dietary treatment of arterial hypertension: High blood-pressure he states is found in a large number of pathological conditions, in many of which the etiological factor is difficult to determine. He declares that the excessive use of alcoholics, tobaccos, coffee, tea and protein; lack of exercise and neglect of generally recognizing hygienic rules are doubtless factors leading to the pathological conditions of which hypertension is the chief indicator. Reduction of the protein in the dietary causes a fall in pressure, as well as amelioration of the symptoms in a vast majority of the cases. We must, therefore, he remarks, conclude that in the conditions resulting in hypertension, the organism is no longer able to utilize the usual quantity of protein. Excessive amounts of the protein of wheat, milk and eggs, is as deleterious as meat protein. Good effects are produced by a reduction of the total amount of protein ingested daily. There is no evidence of putrefactive changes in the intestines with resulting indicanuria as the cause of high arterial tension; the real cause is to be looked for in a more complex disturbance in metabolism, the exact nature of which is as yet unknown.

The generally accepted statement that advance in years is accompanied by a physiological rise in blood-pressure is, he thinks, open to question. In his series of cases, there were many in the aged who responded to treatment by the administration of iodides or protein reduction. Further, he thinks, many persons of advanced years in good health do not present a condition of high blood-pressure.

High arterial tension should be regarded as indicating an abnormal condition which in a large majority of cases is amenable to treatment.

**The Prophylaxis of Mumps.**—Epidemic parotitis has always been regarded as rather of a negligible quantity among the infectious diseases because of its general harmlessness, says an editorial writer in the *Medical Record* (Sept. 11, 1915), and it is probably on account of this attitude that so little is known about its etiology and treatment. It is true that, in children at least, it is a comparatively trivial

affection and very rarely accompanied by more than a transient discomfort, but in institutions it is apt to occur in epidemics which occasion a great deal of annoyance to the managers and an excessive amount of work to the meager nursing staff. We have no treatment worthy the name, and isolation as a prophylactic measure is made difficult by the long period of incubation.

As a rule one attack of mumps confers a complete and lasting immunity upon the individual, and it is therefore reasonable to suppose that such a person carries in his blood antibodies against the infectious agent. Working on this theory Hess (*Am. Jour. Dis. of Children*, 1915, x, 99) has recently been injecting the blood of immunes into children who had been exposed to the infection. His results are interesting for in no instance did parotitis develop in a child thus protected. From six to eight cubic centimeters were obtained from a vein of the donor with a syringe and immediately injected intramuscularly. The procedure was, of course, guarded by the Wassermann reaction and in no case was there any rise of temperature or local reaction. He found it possible to use as donors patients in whom the swelling had not subsided and the long period of incubation permitted inoculation some time after the exposure. Blood injected in this way should not cause trouble because of incompatibility and the whole process seems to be devoid of danger. It should prove of value, especially in orphan asylums and similar institutions, where a large number of susceptible persons are collected.

Suppose we were possessed of two cardboard mailing cases of a suitable size for satchel purposes. Suppose also that No. 1 contained table salt and sodium citrate (ten to one), and that No. 2 held a mixture of equal parts of sodium perborate and of sodium bicarbonate. Then out of the first it would be easy to extemporize something akin to Wright's solution and, out of the second, a solution which would manifest some of the cleansing properties of hydrogen peroxide, plus a bactericidal effect, plus the sedative effect of the bicarbonate upon traumatisms, burns, cellulitis, etc. If the latter solution is employed to cleanse wounds and the former is used to soak the bandages, then results seem almost uniformly good whether infection is present or not.

As a rough and ready way of treating an infected wound, let us suppose some amount of water was given, i. e., a tumblerful or bowlful, and that from box No. 2 we added to that water heaping teaspoonful after heaping teaspoonful; then when the proportion became a little greater than two per cent. (one to forty), an undissolved precipitate would appear and this residue could be used as an index. On its appearance an equal number of heaping teaspoonfuls of the contents of box No. 1 could be added to the solution. The final result of such a process would yield a liquid containing sodium citrate, one to 400, with sodium chloride bicarbonate, and perborate, one to forty. These proportions have been varied, but within certain limits, up to making all the ingredients equal parts, one formula seems to act much like another. If we wish to approximate Wright's idea, one measure of No. 1 in twenty equal measures of water will do it.

For douching, cleansing enemas, etc., also mouth washes, a heaping teaspoonful from box No. 1 with a heaping tablespoonful from box No. 2, mixed together in a quart of water, will prove satisfactory. As to its internal use in hyperchlorhydria and for lavage, that is rather foreign to the scope of the present writing, therefore mere mention is sufficient.

When used upon foul smelling wounds, the deodorant effect of a full strength solution is promptly evinced, and only the more impressively so, because the solution itself is odorless.

If it be urged that all the aforesaid involves too much trouble, then the holder of such a view should discard box No. 1 and place his reliance upon box No. 2 alone. Wright's solution is not for the man who fears that sort of trouble, a phobia which but too often means a placid toleration of dirty finger nails. And what about the patient of such a man? "He may trouble you more than ever, when you have nailed his coffin down."

No. 2 will dissolve the dirt off the hands if it accomplishes nothing more.

One essential in the employment of such a solution is that both wound and bandage shall be made as wet as possible, the latter consisting of layer on layer soaked to saturation, over this a few thicknesses of paper (or a single thickness of paraffin paper), and the whole bound together by a dry roller bandage. In other words, it is a wet dressing and should be considered only as such.

**A Nontoxic Antiseptic.**—Judging from some letters of inquiry that have reached me, says Douglas H. Stewart (*N. Y. Med. Jour.*, December 11, 1915) there is a demand for something in the way of wound treatment which would fill the following rôles, all at the same time: 1. It must be equally applicable to clean or infected wounds. 2. It must not be fluid and a consequent nuisance in a satchel. 3. It must cleanse a wound as peroxide does. 4. It must be a nontoxic, nonirritant antiseptic. 5. It must not affect healing adversely. 6. It must make a solution with water at a minute's notice, and this of definite strength without the preliminaries of weighing, etc. 7. It must be adaptable to the treatment of lacerations, incisions, burns, proctitis, vaginitis, and some other things.

My correspondents do not say so exactly, but I gather that they desire something that is unfailing under all circumstances, regardless of the technic of its application. If that is what is meant, the answer to such a request is beyond me, who can only make an attempt to approach the desired standard and quality of excellence by suggesting the use of two powders to make two solutions; one for wound cleansing and one for dressing purposes, though one may obtain very good results indeed with the two powders mixed in a single solution; but caking and deterioration forbid the mixing of all the ingredients in a single powder.

# American Medicine

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**Municipal Health Activities.**—The activities of municipal health departments grow apace. Citizens are not sufficiently aware of the multiplex activities involved in their protection. In days gone by a health officer's main duties were centered in garbage disposal, ash removal, sewer inspection and similar civic occupations which now, in the organization of health departments of larger communities, are relegated to special municipal departments.

A recent *Survey of the Activities of Municipal Health Departments in the United States* by Franz Schneider presents an approximate resumé of the programs of health departments in cities of the United States with a population of 25,000 or over. Excluding New York City with its large appropriation of over \$3,000,000, the average expenditure for 205 cities was 27.3 cents per capita for distinctively protective health work. The aggregate per capita rate was 44.6 cents from which should be charged off the per capita cost for plumbing inspection, removal and disposal of dead animals, the cost of hospitals and sanitaria and similar expenditures for municipal duties relatively lacking in much hygienic significance.

It is noteworthy that the per capita expenditures of health departments increase, though without direct proportion, as the population of a city develops. To illus-

trate, the average per capita appropriation of health departments in cities from 25,000 to 50,000 is 19.3 cents, 100,000 to 300,000 is 26.7 cents, 300,000 and over, excluding New York City, is 32.6. Variations in appropriation are well marked by the contrast between the corrected figures of Seattle 98 cents and Clinton, Iowa, three-fourths of one cent per capita! The largest appropriations relatively are in the southeastern states while the smallest are to be found in the north central states.

Of 201 cities replying 44 possess the essential features of a program for the prevention of infantile mortality. Of 211 cities, 79 per cent reported some degree of effort to maintain medical inspection of school children. It is noteworthy that in 103 instances medical inspection is conducted under the supervision of the school authorities, while this phase of health work was directed by health departments in only 56 cities.

The problem of venereal diseases is apparently receiving very slight consideration but the report is indicative of progress along this line. Fourteen cities consider case reporting though only 7 require them, 5 requesting them, 2 demanding them from institutions and one making free laboratory

diagnosis conditional upon the report of the case.

Despite all the propaganda for the prevention of tuberculosis it is startling to realize that only 23.9 per cent of the cities reporting have arranged for a comprehensive program of tuberculosis prevention. To be sure, "comprehensive" means compulsory reporting, free laboratory diagnosis, investigation and visitation by nurses or physicians, free sanitarium facilities and terminal disinfection.

Among the newer phases of municipal work, industrial hygiene represents an infant industry. Out of 217 cities only 11 report any effort to attack this problem. The principal work of this type is being done in cities with a population of over 300,000.

Recognizing that the protection of public health requires the elimination of privies, it is almost unbelievable that there are still probably a million privies existent in our cities. In the distribution of these pernicious agents, formerly established for utility, the small cities are relatively in the worst condition though the problem is by no means restricted to them.

These few facts indicate that municipal health work has much to accomplish. There can be no criticism of the enthusiasm nor devotedness of health officers, but there should be a sympathetic recognition of the fact that the importance of public health work has burst forth with such rapidity that municipal appropriations have been unable to expand commensurately. It is not yet timely to investigate the efficiency of the departmental work performed throughout the country. It is far more significant to note various lines of work which they are undertaking. It is comforting to realize that scientific methods are slowly being applied. The larger the city, the greater solidarity

there is in the willingness to make larger appropriations for the maintenance of public health. Public health work systematically organized has just begun.

**The index of the status of public health opinion** in so far as it relates to the taxpayers' pocketbooks is revealed by the per capita cost of the health department expenditures for specific health work. It is impossible to adequately protect communities without the expenditure of public funds. It is impossible to attain a satisfactory health program in a city with 25,000 inhabitants with a total appropriation of \$200 for such work. Per capita costs for health work of 2, 3, 4, 5, and 6 cents serve as barriers to communal development. A health program may be established on paper at a very slight cost, but to carry out its provisions demands a willingness on the part of cities to dip into the public funds freely and at least to the extent of 50 cents per capita. There are some directions of civic work wherein small appropriations do not indicate efficiency but inefficiency and deficiency. Public health propaganda and the prevention of disease is an activity of this type.

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**The Teaching of Obstetrics.**—The practice of obstetrics is an ancient art. Its importance requires no corroborating arguments. Despite the centuries that have passed, however, there continues to be dissatisfaction with its plane of achievement. C. E. Ziegler (*American Journal of Obstetrics*, January, 1916) writing on the teaching of obstetrics confesses that sufficient time cannot be allotted to obstetrics to train competent obstetricians through undergraduate instruction. He admits the un-

fortunate state of affairs earlier proven by Williams that few medical schools are equipped for the proper teaching of obstetrics and that clinical teaching and practical obstetrical experience are woefully lacking in our medical colleges.

In explaining the dire difficulties surrounding obstetrical teaching, he makes the unusual and questionable statement "There does not exist a universal or as yet even a popular demand for good obstetrics; and until there is such it is going to be difficult to improve the quality of the teaching beyond a certain point." He further believes that the "question of good obstetrics ultimately will be solved through the education of the lay public and in no other way." This point of view merits consideration. The following statement is open to more severe criticism. "Students of medicine will not make extensive preparations for practice in a field of medicine which offers so little in the way of returns as does obstetrics today in general practice."

Offsetting this point of view Kosmak (*Medical Record*, June 6, 1914) unhesitatingly writes, "It is generally claimed that the fee obtainable from poor patients during confinement is not sufficient to repay the regular practitioner for his time, and that, as already stated, in many instances the drudgery of such attendance is assumed in order to retain the family practice. While this is a point of apparently great practical importance and a favorite argument, it is not a logical stand to take, and there is no more reason for shunting off this class of practice than any other which may prove more agreeable. By acquiescing in such a state of affairs the profession lays itself open to great blame for what is actually neglectful treatment of one of the most important functions of a woman's life."

In 1910 Abraham Flexner in his startling resumé of medical education in the United States and Canada indicated that the obstetrical training in our medical colleges made an unusually poor showing. His studies revealed the fact that the difficulties and limitations of practical obstetrical experience were too lightly considered by medical schools and as a result inadequate training was the natural consequence.

J. Whitridge Williams (*Proceedings of the American Association for Study and Prevention of Infant Mortality*) in 1911 presented the following conclusions in reference to collegiate instruction in midwifery.

I. Generally speaking, the schools are inadequately equipped for teaching obstetrics properly, only one having an ideal clinic.

II. Many of the professors are poorly prepared for their duties and have little conception of the obligations of a professorship. Some admit that they are not competent to perform the major obstetrical operations, and consequently can be expected to do little more than trained midwives.

III. Many of them admit that their students are not prepared to practice obstetrics upon graduation, nor do they learn to do so later.

IV. One-half of the answers state that ordinary practitioners lose as many women from puerperal infection as do midwives, and over three-quarters that more deaths occur each year from operations improperly performed by practitioners than from infection in the hands of midwives.

Obstetrics cannot be taught didactically. Clinical experience is an absolute essential for the development of medical students into competent obstetricians capable of dealing with the ordinary run of cases, regardless of the particular training necessary to develop the specialist.

**The responsibility for obstetrical training** lies entirely within our medical colleges. To state, as Ziegler does, that good ob-

stetrics is dependent upon the monetary returns to be secured by the practitioner is to offer an argument that reeks with commercialism and that is false to every fine ideal in medical training. Medical colleges themselves are preeminently concerned with the teaching of medicine and surgery in all its phases. Their judgment as to principles, practice and methods of teaching in every clinical subject is not to be guided by the gross financial rewards later to be achieved. Their function must be determined by the relative needs of the public and the necessity of training general practitioners adequately equipped to satisfy those needs.

The standard of obstetrical teaching is not low because the standard of obstetrical practice is low, as Ziegler words it, but the standard of obstetric practice is low because the standard of obstetric teaching is low. Improvement in obstetric teaching is not to be solved through the education of the lay public, because the lay public can only be educated in the standards of good obstetrics through the administration of the highest form of obstetrical practice by the graduates of our medical institutions. There cannot be a double standard of obstetric practice for the medical profession except in so far as there will always be a differentiation between the type of service which may be rendered by a general family practitioner and that available at the hands of a specialist in any phase of medicine or surgery.

Pregnant and parturient women are not merely entitled to good obstetrical service, but they merit the most efficient and capable assistance possible regardless of the fee paid. The standard of obstetrical fees varies throughout the United States according to current practice and the general economic status of the community or of the particular part of the community served by

various practitioners. It is irrational, commercial and cruel, as well as vicious, for an obstetrician to suggest that the labor case yielding fifteen dollars does not demand or deserve the same degree of skill, asepsis, and scientific judgment enjoyed by the parturient woman whose more fortunate husband is able to expend a hundred dollars for obstetrical attention.

As long as obstetrical teachers coincide with this shortsighted low-standard principle of determining the quality of obstetrical teaching, we can expect but little improvement in our medical colleges. Fortunately this weak economic argument is not accepted by teachers with social vision or social conscience. Carelessness and indifference in obstetrical practice must be offset through the action of teachers themselves who will recognize in obstetrics a fundamental branch of medicine. They will feel their responsibility for the training and education of general practitioners competent at least to conduct cases of normal labor. Until a time comes when obstetric teaching throughout the land shall be above reproach, it is useless for obstetricians to criticise and condemn the practice of midwives. Meanwhile, the responsibility for poor obstetrics does not rest with the people but with the medical profession—particularly that portion of the profession entrusted with the unusual opportunities of providing and administering obstetrical education.

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#### **The Conquest of Typhus Fever.—**

Among the scourges dating from antiquity, none has killed its ten thousands with greater facility and awfulness than typhus fever. From the time of the plague in

Athens in the fifth century B. C., it has ravaged many lands—and influenced the destiny of nations. Particularly has it been an ally of Mars and fought along with powder and shot for the desolation of mankind and the ruination of states.

The popular synonyms attest the principal conditions allied with the deadly spotted fever. How significant are the terms "ship fever," "jail fever," and "camp fever?" Destitution and misery have always been regarded as natural predisposing causes to its existence. For many years its spontaneous development on such soil was regarded as possible from the fearful ever present, but never active miasma.

Conditions of comfort, proper housing and adequate ventilation have been honored as the most favorable prophylactic agencies. Even in the third edition of Hare's Practice (1915) we find it stated, "There is no disease in the prevention of which fresh air plays so large a part as it does in typhus fever. Indeed, it may be stated that if a healthy man be supplied with plenty of fresh air while in the presence of the sick he will have a fair chance of escape, whereas if the air of the room be impure, infection is almost certain, for, as already stated, typhus fever is a malady of darkness and poor ventilation."

**In the history of typhus fever,** medical men of the United States have played an important part. To the therapeutics of the disease up to very recent times, they have contributed little. When 1,200 cases of typhus appeared in Plymouth, Pa., during 1885, or when it flourished in New York City in 1882, the therapeutic knowledge regarding typhus was only a little less negligible than it is at the present time.

For many years, the disease was confused with typhoid fever. Gerhard and Pennoch in 1837 were practically the first to point out the distinguishing variations between the two diseases. In 1842, Elisha Bartlett published the first separate description of the two diseases in his book on the Diagnosis and Treatment of Typhus and Typhoid Fever.

The disease, particularly epidemic in character, was scarcely recognized as maintaining endemic foci until Brill in 1898 described a disease which temporarily was given his name until Anderson and Goldberger demonstrated it to be a mild type of typhus fever, allied with the Tarbadillo of Mexico. In 1915 Plotz, spurred by an earnest purpose to discover its cause, was successful in isolating the organism now accepted as the specific etiological factor. The vaccine prepared from his organism is now on trial. Thus far it seems to exert a tendency to abort the disease but apparently has only slight therapeutic value. Its immunizing benefit is problematic though the present experience with its use in the Balkans suggests that as a secondary prophylactic agent it merits prompt usage. The primary prophylaxis against typhus fever is the elimination of the louse.

B. W. Caldwell (*J. A. M. A.*, January 9, 1916) describes with stimulating force and expressive clearness the experience of the American Red Cross Sanitary Commission in Serbia in winning a complete victory over the typhus epidemic existent there from December, 1914 to July, 1915. Fully a half a million persons were afflicted and 135,000 succumbed to the disease!

It is obvious from the facts elucidated that typhus fever is readily prevented and this country need not fear an invasion of the disease, even though some immigrants

might perchance slip beyond the control of our quarantine officials. The disease is principally contagious during the five days of the eruptive period but only in the presence of the body louse—and possibly the head louse.

The entire story of prevention of typhus fever may be summed up as the maintenance of cleanliness. Plenty of water and soap, the disinfection of clothing, the application of kerosene oil together with general sanitation will not merely clear up an epidemic of typhus fever, but will prevent its occurrence.

The American Commission under the direction of its competent director, Dr. R. P. Strong, within three months won the campaign in Serbia. The fumigation of hospitals, barracks and schools was the first step in its organized work. Patients were bathed in soap and water and kerosene and their clothes were disinfected by steam at a temperature of 115° C. for 30 minutes, after which they were placed in a vermin free ward. Houses containing stricken victims were fumigated and the patients were isolated and quarantined. Numerous bath houses were built, sewers constructed and sewage and garbage disposal provided. Such simple measures were adopted by Germany, Austria, Greece and the various countries concerned with the protection of their population from the importation of typhus through voluntary immigrants or prisoners.

**The treatment of typhus fever** comparatively speaking is absolutely unsatisfactory. The general regulations that would apply for the care of any infection of septic type represent the sum total of our knowledge on this subject, unless the vaccine of Plotz is ultimately proved to have marked therapeutic value.

The main lesson learned from the activities of the United States Commission in Serbia is that the war against typhus fever is reduced to a problem in economic entomology. As the antiplague campaign has resulted in a fight against rodents and their accompanying fleas, so typhus prevention has been concentrated in the elimination of the *pediculus vestimenti* and *pediculus capitis*.

The achievements of our sanitary commissions are eminently gratifying. It is true that thus far they have not added greatly to our store of knowledge of therapeutics or prophylaxis but, in common with the sanitary commissions of other nations enjoying war or peace, they have demonstrated anew the powers of modern sanitary methods and the tremendous life saving value of personal cleanliness.

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**The Migration of Indigent Consumptives.**—In the *Public Health Reports*, June 18, 1915, Passed Assistant Surgeon Lanza calls attention to the relation of interstate migration of tuberculous persons to public health. His studies dealt specifically with the problems of Arizona and Colorado.

For many years physicians have been giving definite advice to consumptives to go out west where the climate is more conducive to physical welfare. To the incipient tuberculous, to the advanced consumptive, to those afflicted with a tuberculous infection of bones and joints, to the rich, to the poor, to the industrial worker, to the professional man, to the unemployed, to young and old, single or married, this advice represented a simple solution of the problem before them.

The migration of patients lacking adequate financial resources, should, however, be universally discountenanced. The climate of the west or the south, on the plateaus of New Mexico or the mountains of Colorado, does not suffice to mitigate the evils attendant upon a lack of adequate food, clothing, or shelter. The dependent consumptive or the afflicted man fraught with the responsibility of maintaining a family is further depressed and becomes a more certain victim to this disease when transferred to a healthful climate without the accompanying social relief necessary for securing his cure. No consumptive should be encouraged to seek new fields of living unless his savings or financial resources are adequate to meet all necessary expenses for at least the period of one year, and preferably two years. Climate does not restore fatness to the shrunken pocketbook. Financial poverty carries with it serious disabilities against rapid return to health.

From the standpoint of the states possessing the most favorable climate it is manifestly unfair that indigent tuberculous persons should become a liability to them and claim the attention of city or state institutions or become charges upon private philanthropy. The effect of such migration is well manifest, for example, in Colorado. During 1913, one-sixth of all the deaths in the State of Colorado were due to tuberculosis while the ratio for the entire United States registration area was only one-tenth of the total mortality. In New York State it was one-ninth. During the same year in Colorado 90 per cent. of the total deaths from tuberculosis were due to pulmonary tuberculosis, while in the registration area and in New York State only 83 per cent. of the tuberculosis mortality was due to pulmonary tuberculosis.

It is patent that the helpful climate of Colorado has been the cause of securing an unnatural tuberculosis death rate for that state and the same fact obtains presumably for Arizona, New Mexico, California and similar portions of the country to which the migration of the tuberculous has been most marked.

The indigent tuberculous produce serious medico-sociological problems for which there is little excuse. For the indigent consumptive there are no advantages in migration; the disadvantages are apparent at every turn and the end results are soon manifest in their discouragement, increased disability and rapid decline.

**The spread of tuberculous disease** because of the transportation of migrating tuberculous individuals is probably negligible. Transportation facilities are such as to practically nullify all dangers from this source. Comparatively speaking, the crowding together of sufferers from open tuberculosis, untrained in matters of hygiene, with free expectoration is a more serious cause of spreading tuberculosis. This is particularly true when the underfed and weakened bodies of sufferers from the white plague are in constant daily association with persons in similar social condition but still free from actual infection. Unclean rooms, congested sleeping quarters and financial dependence call forth further victims, particularly from the child population in homes harboring tuberculous members. It is but natural that states should resent the constant influx of consumptives unable to protect themselves and thus serving to present new foci of infection.

The consumptive need not migrate in order to secure restoration to health. In fact, his opportunities for betterment are

heightened if he forego the visit to the "land of promise" though not of fulfillment. The Home Hospital Experiment has been fairly demonstrated by the Association for Improving the Condition of the Poor of New York City as an excellent and economic means of preventing the spread of tuberculosis, of securing early cure, of improving the health and earning capacity of persons in moderate circumstances, and of creating a greater likelihood of family rehabilitation.

The National Association for the Prevention of Tuberculosis in 1912 ascertained that the average daily per capita cost for the care of the tuberculous in hospitals caring for advanced cases was approximately \$1.49. Equally valuable results may be secured through the Home Hospital Experiment at a per capita cost of 26.9 cents. It would be therefore far better for communities to establish a series of home hospitals, with the cooperation of existent charitable societies to care for the indigent consumptives rather than to transport the victims to sanatoria and spend large sums of money for the care of their dependent families.

It is equally obvious that physicians are giving absolutely unjustifiable advice to patients of moderate means or in a state of dependence when they advise them to betake themselves to higher, cooler, and drier climates. If there were national sanatoria on the cottage plan under government auspices, there might be some slight excuse for the transportation of tuberculous indigents to the healthful southwestern sections of the country. It is exceedingly doubtful, however, whether the monetary cost of such institutions would be warranted in the light of the benefits to be secured in the treatment of consumptives in their own homes through the medium of tuberculous classes so well

worked out in Boston, or in Home Hospitals so capably and efficiently administered in New York City.

The problem of Colorado or Arizona is not limited to the inhabitants of those states but is a serious question involving the health and welfare of potential migrators from all sections of the country. The social questions involved are pregnant with meaning to humanitarians throughout the country. The medical phases must appeal to all physicians interested in establishing the most favorable prognosis for their patients. The benefits of climate on tuberculosis are conditioned by the social status of the victims as well as by the degree of virulence of the infecting bacilli. Wise, then, is the family physician who refuses to consign his patient to an illusory city of dreams where the beautiful vision may quickly fade and health become even more elusive.

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**Foster Home or Institution?**—Institutions are frequently pointed out as evidences of the humanitarian tendencies of communities. In a serious sense, the existence of various types of institutions is symptomatic of social disease. The existence of foundling hospitals and institutions for the care of babies may hardly be regarded, in the light of modern knowledge, to be uniformly a humane device.

The mortality statistics in foundling institutions are indicative of wastage of life, though fortunately the ratio of deaths to yearly admissions has been somewhat decreased. It is not so many years ago when foundling asylums merely represented the establishment of more or less comfortable places in which infants might slip into eternity. The statistics of modern infant





asylums are depressing, presenting, as they do, mortality rates varying from 30 to 60 per cent.

The Foundling Hospital of London had a mortality rate of 69 per cent for children under 5 years of age. Such a serious condition naturally awakened the interest of thoughtful workers and for at least the past 5 years no children have been permitted to remain in the institution until they have passed their fifth birthday. The hospital itself simply served as a receiving and distributing center whereby children might be placed out into foster homes.

S. Josephine Baker (*Woman's Medical Journal*, January, 1916) presents figures strikingly illuminating the possibility of the reduction of institutional mortality among infants, through the provision of a placing-out-system. Special advantages accrue to sub-normal infants who thus secure the benefits of competent foster mothers. At a daily per capita cost of 62 cents the infantile mortality of sub-normal children has been reduced by at least 50 per cent. The cost for less efficient care, measured in child saving, in hospitals varies from \$1.00 to \$2.29 a day. It is patent that the economic advantages of a well organized placing-out-system are considerable in terms of money. The more definite social economic advantage, however, lies in the actual protection of under-nourished or ill children, resulting in their gain in vitality and strength and maintenance among the living.

**Provision must be made for abandoned infants** or those voluntarily given up by unmarried mothers who feel unable to bear the double burden. Society's obligation, however requires that these two factors do not militate against the rational and hygienic care of the children. To permit the

waifs of society to be consigned to institutions where the chances of life are the slightest is indefensible. Every dictate of service, philanthropy and medicine demands that special attention be given to the welfare of those children who are denied their due parental care.

Under these circumstances the mortality of infant asylums and hospitals and institutions for foundlings throughout the country should be thoroughly investigated. Their physical expansion should be limited and the funds which may be available for architectural improvement or mural decoration should be more wisely administered for the adoption of the placing-out-system in foster homes. It is sufficiently condemnatory that the maternal instinct of foster mothers must be utilized. Human personal care is essential for children. Institutions while not soulless are heartless unknowingly. Competent medical and nursing supervision may assist in promoting infantile welfare, in educating the foster mother and in lessening the infantile mortality. Infantile health is best preserved or secured in a home where health, affection, and intelligence abound.

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**Lung Suppuration After Operations on the Throat.**—H. Wessler (*Interstate Medical Journal*, January, 1916) discusses lung suppuration after tonsillectomy on the basis of his experience in finding 8 cases out of 28 cases of pulmonary suppuration following tonsillectomy. He calls attention to the fact that a general anesthetic was administered in each of these cases and must undoubtedly stand in close relation to the pulmonary infection. Inasmuch as tonsillectomy is such an exceedingly common prophylactic

and therapeutic procedure at the present time, it is well to have attention called to the possible accidents following its performance. It is practically conceded that a general anesthetic is necessary and desirable for the successful enucleation of tonsils, although some operators, after careful experiment, have been able to perform satisfactory operations without pain to the patient under local anesthesia.

A practical question arises as to whether the lung suppurations after tonsillectomy may not have been due to faulty anesthetic technic. Possibly too deep anesthesia was secured and maintained without the use of a suction apparatus to remove blood from the pharynx.

Wessler does not describe the operations following which the other lung suppurations occurred. Wherefore, it is not out of place to consider whether possibly these also may not have followed operations on the nose, mouth, or throat with the consequent development of aspiration pneumonia going on to suppuration.

The bacteriology of the tonsils removed was not determined nor indeed is any reference made to the organisms responsible for the lung suppuration. It seems therefore, of greater significance to stress the importance of proper anesthetic technic in all operations on the nose and throat than to assume that tonsillectomy itself is inherently more conducive to lung suppuration than other operative procedures.

The operations for the removal of tonsils and adenoids are certainly too frequently performed. They possess, however, great medico-social significance and it is unwise to establish unnecessary fears as to concomitant dangers. Unless the suppuration sequel is demonstrated to be inherently related to the specific operation of tonsillectomy

rather than to the derelictions of the anesthetist, its possible occurrence should not serve to inspire fear. If a general anesthetic is to be employed, as is universally advised, the responsibility for preventing aspiration pneumonia certainly rests upon the shoulders of the anesthetist. This appears a reasonable suggestion, in view of the fact that insufficient attention has been given to the importance of scientific anesthetization in this country.

Unfortunately, too inadequate preparation at times is given to patients awaiting operations on nose and throat. Still more unfortunately, some poorly trained operators are anxiously seeking to take out tonsils and money with the greater success at the latter operation. With clumsy, half trained snare wielders or tonsillectomists, with an uncertain, careless or unknowing anesthetist and a child well fed up to the time of operation, lung suppuration might be expected. Considering the thousands of operations on the tonsils each year, the infrequent occurrence of aspiration pneumonia or lung suppuration bears witness however to the general plan of carefulness and skill in the profession. As lung suppuration is preventable, there should be few further cases reported as following tonsillectomy.

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**Crime and Religion.**—Those of us who boast of our Christian civilization and "Kultur" take note: "By their works shall ye know them."

There is one criminal to every 274 Europeans.

There is one criminal to every 509 Eurasians.

There is one criminal to every 709 Hindus.

There is one criminal to every 1,361 Brahmins.

There is one criminal to every 3,787 Buddhists.

LOUIS VIARDOT.

**Fifty Years of Municipal Health Service.**—The review of a half century's work in any line of human activity affords many opportunities for serious reflection, constructive criticism and congratulation. On March 5, 1866 the New York City Department of Health was established and its semi-centennial merits celebration. Upon this occasion AMERICAN MEDICINE takes pleasure in offering its cordial congratulations to

Dr. HAVEN EMERSON

efficient management which has raised the value of their Health Department to its present high place. It takes more than fifty years to achieve perfection, but the Department serves as a model organization for most cities in the country. To the present Health Commissioner, Dr. Haven Emerson, AMERICAN MEDICINE extends warmest felicitations upon his opportunity to serve the community and voices its confidence in his idealism, practical judgment and intelligent devotion to the health service of the Greater City.

In 1866 a Citizens' Committee called the attention of the Legislature to the insanitary conditions then prevailing in New York City and secured the passage of a law recognizing health administration. A Senatorial Committee had reported that the City of New York had a higher rate of mortality in proportion to

Dr. STEPHEN SMITH

its population than other large cities in the United States and Europe. The excessive mortality was mainly attributed to

"overcrowded conditions of tenement houses; the want of practical knowledge of the proper mode of constructing such houses; deficiency of light; imperfect ventilation; impurities in domestic economy; unwholesome food and beverages; insufficient sewage; want of cleanliness in the streets and at the wharves and piers; to a general disregard of sanitary precautions; and, finally, to imperfect execution of existing ordinances and the total absence of a regularly organized sanitary police."

As far as even accurate statistics are available, the mortality rate in New York per thousand population varied from 21.5 in 1810 to 36.5 in 1855. The total number of deaths under one year, including the still-births and premature births, formed more than 28 per cent. of the total deaths for the fifty years between 1804 and 1853 inclusive. It was an act of wisdom that in the face of such mortality the Board of Health for the Metropolitan Sanitary District of the State of New York was established. The original district comprised the counties of New York, Queens, Westchester and Richmond, and the towns of Newtown, Flushing, and Jamaica, in the county of Queens.

On March 5, 1866, the Board of Health was organized with Jackson S. Schultz as President. The Sanitary Commissioners were Doctors James Crane, Willard Parker, John O. Stone, and John Swinburne who was Health Officer of the Port. Dr. Edward B. Dalton was Sanitary Superintendent, Dr. Elisha Harris was Registrar of Vital Statistics.

DR. JOHN  
SWINBURNE

CAT.

The first annual report in 1866 covered the proceedings from March 5 to November 1. Owing to the fact that cholera had broken out in the city during May, 1866, a considerable portion of the report was devoted to a discussion of this subject. Particularly noteworthy is the comment on the use of disinfectants in stamping out cholera. In the words of the report, "The chemicals most frequently employed for the purpose have been sulphate of lime,

**DR. JOS. D. BRYANT**  
 the chloride of lime and soda, permanganate of potash, sulphur for fumigation and carbolic acid. In the early part of the year their relative value and their peculiarities were not perfectly understood, the processes of preparing and the manner of using them being largely experimental; but study and experience established their respective qualities and gave system to their application. The sulphate of iron destroyed the germ of cholera and disinfected drains, privies, and other filthy places, which aid in the development of the cholera poison. Its cheapness and uniform success, places it at the head of all disinfectants. Chloride of lime has been successfully used in disinfecting filthy yards, cellars and streets. Permanganate of potash destroys the poison in clothing and bedding without materially injuring them. Carbolic acid has not been sufficiently used by the officers of this Board as a disinfectant, to surely establish its relative value, but it is regarded with satisfaction. In cases where any dwelling of the tenement has been invaded a second time by cholera sulphur fumigations have been used with wonderful success."

The second annual report drew attention

to the great prevalence of venereal diseases in New York. Its sensible recommendation "that all hospitals and dispensaries which receive pecuniary aid from the State shall be obliged to treat venereal diseases," indicated a thorough appreciation of the importance of this field of service although the recommendation has never been carried into effect.

**DR. THOMAS DARLINGTON**

now termed "sanitary matters," most of which have been relegated to the activities of specific departments of municipal administration. Such, for example, were problems relating to the cleanliness of areas, halls, and yards, the removal of ashes, garbage, and rubbish, the control of offensive trades, the supervision of tenement houses, the care of public markets, and the condition of sewers, etc.

With the development of the new science of bacteriology, public health administration underwent a marked change. The attention of health officers was deflected from sewer gas, miasma and emanations of rubbish and refuse to the true sources of infection, namely, the etiological micro-organisms.

A marked step in advance was taken by the Department when tuberculosis was officially declared to be an infectious and communicable disease. While Dr. Joseph D. Bryant advocated that tuberculosis should be controlled by the sanitary authorities this recommendation was not adopted by the Board of Health until 1894 under the commissionership of Cyrus Edson. The tremendous advances which have been made in the control of tuberculosis during the past twenty-two years reflect great credit upon the progressiveness, force, acumen and authority of the Health Department.

**DR. E. G. JANEWAY**

**DR. S. S. GOLDWATER**

An epoch in municipal administration was marked by the establishment in 1892 of a Division of Bacteriology and Disinfection. The final argument necessary to secure an appropriation for the establishment of this Division was the difficulty of distinguishing between epidemic cholera and cholera nostras. In the face of an existent epidemic of cholera the importance of the institution advocated was fully realized. As a result, the first municipal bacteriological laboratory in the world was established. Its development, particularly under the guidance and direction of Dr. William Park, is a subject of intense satisfaction, for its work has added much to our store of scientific knowledge, has gone far to advance bacteriological technic and to develop those rational procedures now accepted throughout the scientific world for the control of infectious diseases. The tremendous social gain resultant from the facilities afforded to practitioners for the examination of sputum for the diagnosis of pulmonary tuberculosis, in itself, has been sufficient to warrant all the appropriations made for this Department.

In 1894 the first appropriation was made for the production, distribution and administration of diphtheria antitoxin. It should be recalled that at this time the use of this therapeutic agent was still in the experimental stage. Only Behring and Aaronson in Germany and Roux in Paris were producing the remedy and in a very small way. The introduction of these intelligent and rational health activities set the pattern for sanitary authorities in every city in this country and in Great Britain and its influence was felt throughout Europe.

A further advance in health methods, particularly in organization, for limiting the morbidity and mortality among children was instituted in August, 1908, when the Division of Child Hygiene was created as part of the Sanitary Bureau of the Department of Health. During 1913 the work of the Division had assumed such large proportions that it was established as an independent bureau. Thus constituted, it ranks as the first organization established under municipal control to deal with the various problems concerned with the health of children from birth to legal working age. Its Director, S. Josephine Baker, under the direction of successive Commissioners of

Health has constantly improved the quality of service while enlarging the fields of activity of this Bureau.

Another noteworthy accomplishment was the institution of medical examination and inspection of school children in 1897 which at the time of its inauguration was in charge of the Division of Contagious Diseases.

One of the most important developments of the activities of public health service was the establishment of the Bureau of Public Health Education in 1914. This innovation occurred under the auspices of Health Commissioner Goldwater, whose all too brief term of office gave a new impetus and a higher standard for health officers throughout the land. Under the direction of Dr. Charles Bolduan, lectures, health exhibits, publications, moving pictures, and activities of various types have been added to the utilities employed by the Health Department for the education of the citizenry in the health value and social advantage of life conservation. In a sense a culminating step in health activity is engrafted upon the activites of the Health Department—the newer vision of medicine. While educational activity has always been recognized as a function of the Department, the crystallization of its efforts in this direction was not secured until the work was unified and placed under the direction of the Director of Public Health Education.

It is not possible in a brief recapitulation of the Department's achievements to give credit to all the Directors of Bureaus and Chiefs of Divisions. The incumbents in all these special offices have been physicians with prodigious energy, large vision, unusual courage, as well as individuals well informed as to the world's enterprises along their lines of service. To their combined initiative, forethought, zeal and enthusiasm the excellent accomplishments and progress of the Health Department are due.

To the Health Commissioner and his large corps of able assistants, AMERICAN MEDICINE extends its best wishes for the continuance of their constant efforts in behalf of the public weal. With the slogan "Public Health is purchasable" emblazoned on their banner, may they march forth to greater triumphs. Their work is not overshadowed by the wings of flying years but is yearly revealed. Now after fifty years we behold the harmonious evolution of a

health department to which a multitude of workers have contributed time, thought, energy, and soul. A line of illustrious Health Commissioners including among others Willard Parker, Stephen Smith, Edward G. Janeway, Joseph Bryant, Cyrus Edson, Ernst J. Lederle, Thomas Darlington, Sigismund Goldwater, collectively have created a splendid monument to constructive medical science and the application of educational methods to municipal hygiene.

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**The Individual Unique.**—It was Hauptmann, we believe, who declared it "impossible to make the inevitable course of an individual's destiny comprehensible in all details. Every man from birth to death is an unique phenomenon with no exact counterpart in the past or in the future. The observer understands only those things within the limits of his own particular nature."

Heredity and environment without doubt play an all important part in fashioning the individual, more perhaps than we comprehend. We have conquered other animals than man, and through selective breeding, man holds dominion over all the animate world except himself. There being no superior mundane intelligence to mould and fashion man than that of mankind, it follows essentially that he is a law within himself. But through a study of biology, zoology and psychology, the human race has discovered the knowledge wherewith it may emancipate itself from blind obedience to preconceived limitations. Composed of highly complex compounds which are exceedingly unstable, subject to the influence of conditions which modify the functions in his physical and mental development, man is beginning to realize the importance of those all important forces, heredity and environment, which alone can be utilized to produce the superman. Character must become broad, all inclusive; the customary reaction of the individual must be subservient to his environment, and herein lies the individuality of man, for his uniqueness is the sum total of his reactions—and these cannot be predetermined.

"All that is all,  
Lasts ever past recall.  
What enters into thee  
That was, and is, and ever shall be."

How then can there be uniformity in man when he is the composite of his ancestors, each in themselves unique? Some of our eugenists, euthenists, genetists, assume the possibility of a rehabilitation of the race; but to what standard are we to aspire? Further improvement in physique, mentality and character building is assured us through selection which inevitably entails the passing of the unfit—the survival of the fit; but human limitations are here in evidence, for if carried to the uttermost plane of successful breeding, we will still have an individuality which must of necessity be unique, that the forces of heredity and environment will surely produce no matter what other influences may be exerted. Therefore, though it cannot be denied that much can be achieved in an united effort to improve the human race, we must not lose sight of the composite man—a result of the inherited limitations of his ancestry.

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**An Unjust Law Proposed in Massachusetts.**—We understand that a so-called "bill" will be introduced in the House of Representatives of Massachusetts at the coming session which will be of very great interest to the medical profession of the whole country as well as of that State. The bill is said to read as follows:

"It shall be unlawful for any physician or surgeon to fail to render his professional services to any sick or injured person in need of such services, as promptly as circumstances permit, provided that he is so requested by, or in behalf of, the sick or injured person; that he is not prevented by illness, absence, professional engagements or by any other unavoidable cause, from rendering such service, and provided that the sick or injured person is at the time in the same city or town in which the physician or surgeon practices.

"Refusal or neglect by any physician or surgeon to render professional service, when so requested, to a sick or injured person then being in the city or town in which the physician or surgeon practices, shall be considered as a violation of this act unless it be affirmatively shown by the defendant that such refusal or neglect was unavoidable as above defined.

"For any such service as is required by the provisions of this act, the physician or surgeon rendering the same shall be entitled to receive and may recover reasonable compensation, and if the compensation is not paid within six months by the patient or some one in his behalf, it shall be paid by the city or town in which the service was rendered.

"Violation of this act shall be punished by

a fine of not less than \$5.00 or more than \$100.00."

The *Boston Medical and Surgical Journal*, (December 16, 1915,) in commenting on the above bill editorially considers it not only unreasonable but unjust. It is presumably aimed at physicians who, for sufficient and obvious reasons, decline to attend cases of criminal or dubious abortion, or patients who have already been in the hands of other practitioners. It is not believed just that the community should be made responsible for such a debt or debts incurred by its irresponsible members. Such a law would foster a refusal to pay such a debt and otherwise embarrass the physician.

We believe with the editor of the *Boston Medical and Surgical Journal* that physicians or surgeons can be trusted to give such service as is consistent with ethics and humanity. Besides, such a law would bring an increased burden on the taxpayer of the community. We seriously doubt if any considerable number of medical men in Massachusetts will approve of such a law.

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**A Real Estate Owner's Protest.**—The blindness of real estate men to any considerations except as related to a reduced tax rate has often been commented upon. It is unbelievable that physicians affiliated with real estate organizations do not give more attention to the hygienic aspects of the recommendations of their organizations. The Real Estate Board of New York has initiated a new program in the body of which occurs the following clause:

Department of Health—*Restrict to legitimate functions and check socializing tendency.*

It is pertinent to ask if the Real Estate Board of New York is really so far behind modern conceptions of civic usefulness as to demand that the Health Department confine its work merely to the cure of the diseases of the community without attempting to conserve public health through the correction, mitigation or prevention of conditions tending to increase the city's morbidity?

The very standard of a health department's efficiency today is indicated by its social vision. To limit activity to the forms of service common fifteen years ago would be a backward step and the general public

would soon pay for its retrograde conservatism.

It should be obvious to real estate owners that the more healthful the community is, the better are the economic returns to society including real estate owners. Active cooperation with health departments looking forward to the expenditure of public funds for the preservation of health will within a few years create a decreased expenditure of money for the unnecessary institutions now demanded because of the failure during earlier years to recognize the importance of medico-social problems. If real estate owners were to utilize their vast power and influence to secure more adequate attention to healthful conditions in their properties they would not fear a socializing program by a health department.

It is possible that the attempt to restrict the development of a rational social health program originates from a desire to protect their properties from the inspectorial scrutiny of health officials. Were their holdings in a sanitary condition above reproach they would not fear the extension of a social program. In their blind endeavor to save a few dollars for themselves they overlook the rights of the community to enjoy health and happiness in return for the rental paid.

It is time that physicians awakened to the importance of guiding the deliberations of their fellow real estate owners along the lines leading to an understanding of the significance of the medico-social work generally advancing throughout the country. In the long run the taxpayer is the rent payer. A tenant in health is far more desirable than one diseased or crippled. The health of the pocketbook is greatly promoted by health of the body and mind.

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**A Learned Judge's Interpretation of the Drug Law.**—Elsewhere in this issue will be found the opinion rendered by the Hon. John J. Freschi, Judge of the Court of Special Sessions, in acquitting Dr. D. J. Hoyt of the charge of violating the Boylan drug law. This case is the one we have referred to on repeated occasions during the past few months and while we have stoutly maintained from the first that it did not seem possible that Dr. Hoyt could be convicted under the circumstances that existed, we are none the less pleased and gratified

at the final outcome. Much credit is due Dr. Hoyt's attorneys. He was especially fortunate in having as one of his counsel, Dr. J. J. O'Reilly, who in addition to being a practitioner of medicine, is also an active member of the New York Bar. Dr. O'Reilly's grasp of the practical medical phases of the case was a vital factor in its conduct and outcome. Another factor of the utmost importance undoubtedly was Dr. E. S. Bishop's expert testimony in the course of the trial on the subject of drug addiction, afflicted patients' needs, and so on. Dr. Bishop's experience and broad and comprehensive knowledge of the situation, together with the fact that he is one of the few experts on drug addiction who can speak not only with authority, but as a physician of the highest honor and integrity, made him a tower of strength for the defendant.

Judge Freschi's opinion (see page 133), however, is a masterly summing up of the whole case and shows not only a keen and erudite comprehension of the points at issue, but also a due appreciation of the medical problems involved.

It is a matter for congratulation that a case that meant so much to honest practitioners of medicine could be tried under such favorable conditions. The medical profession as well as Dr. Hoyt owe a great deal to Dr. O'Reilly, Dr. Bishop, and above all, to Judge Freschi's intelligent estimation and interpretation of the facts presented to him.

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**The Quarantine Station at New York Under Federal Control.**—The quarantine station at New York is being surrendered to the Federal Government. Baltimore is the last remaining port where federal quarantine does not exist except by way of cooperation. It is to be hoped that before the year is over this too will be taken into the fold. Quarantine power at Boston was assumed by the Public Health Service during 1915. During the last 27 years 67 different ports have been transferred to national control and as a result much greater economy, efficiency and uniformity in quarantine methods have been secured.

The supervision of the port of New York is the most important among all the quarantine stations inasmuch as it is the principal point of entrance for European immigrants. While at the present time immigration has greatly decreased owing to the foreign conditions, undoubtedly unusual vigilance will be necessary at the conclusion of the war to prevent the entrance of immigrants infected by various communicable diseases. With cholera, typhus and the plague rampant abroad, it should be a source of congratulation in all parts of the country that the Public Health Service is to be held responsible for the guarding of the country from the entrance of such foes.

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**A Difficult Problem in Medical Economics.**—The complexities of medical service to indigent dependents were recently rendered more difficult by a ruling of the Attorney General of the State of Wisconsin. It appears that the town authorities of Antigo, Wis., have denied a fee to two physicians who performed an urgent operation upon a dependent sick woman. The time element appeared to be so important that the operation was done without the formality of consulting the town council and securing a specific authorization to perform the necessary service. Using this technicality as a good excuse, the town authorities refused to pay the bill and their position has been substantiated by the Attorney General of their state.

Technically these authorities may be right; but it would seem that justice had not been given to the doctors. Surely circumstances might very easily arise as a result of which the formalities of securing a written consent by the proper legal authority for the performance of urgently necessary medical or surgical service, would render the service useless and thwart the avowed object of the town or city in arranging for the care of its indigent sick—the preservation of human life.

We believe that the old adage "Circumstances alter cases" applies here; and from the viewpoint of an outsider the doctors have not had "a square deal."



## CONTRIBUTIONS TO THE EXPERIMENTAL SURGERY OF THE MEDIASTINUM (EXCLUDING THE HEART).

BY

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To give exact account of the enormous progress accomplished in the last few years with the introduction of the various methods intended to prevent operative pneumothorax, we must go back for a moment to the old studies on this subject, and see with what difficulties and with how much ability the earlier investigators worked when they had to attack the mediastinum with reference to the pleura, anteriorly or posteriorly, operating at great depths and running severe risks of accidental lesions of most vital organs. It is only with admiration that we read the memoirs of Biondi, the true creator and precursor of this surgery which today with the new technique seems so much simpler; of Bossi, V. Mickulicz, Levy, Gosset, Rehn, etc., who with boldness and ability did not hesitate to open the pleura and attack the thoracic portion of the esophagus, trying to limit the consequences of pneumothorax, because they had well understood that this was the only and true way to reach the mediastinum. As wonderful also is the ability shown by various investigators in attacking, without injuring the pleura, the great vessels and

ligating them in order to study the effects of the ligature.

All this is now past; today we operate on the mediastinum through the pleura, as on any other part of the body, and many operations which once seemed impracticable on account of the necessity of opening the pleura, are today relatively simple and easy. The negative pressure of Sauerbrück, which has the wonderful advantage of putting the lungs, with the pleura amply open, in conditions absolutely identical to the physiological, requires an expensive and complicated apparatus which cannot be within the reach of everyone and which moreover has never permitted ample experimental researches and perhaps not in all emergency cases can it be practically applied. The box of Braun and the masks of Tiegel, Schoemacker, etc., which eventually may render some useful service to human surgery, meet with the difficulty of creating perfectly airtight space before the mouth and nose of the patient; moreover, obtaining the positive pressure by interfering with the expiration of the patient, is always to count on the danger of asphyxia. Not even these methods have ever been very useful in extensive experimental researches. We applied the positive pressure method to the small laboratory animals; but aside from the comparatively high mortality, we have never been able to perform any mediastinal operations of any entity and extent.

The continuous intratracheal insufflation

method which although has not lacked any precursors (Kuhn), still in the form given it by Meltzer Auer, found the greatest notoriety and diffusion in the world, requires an apparatus of the greatest simplicity. Elsberg has published more than 200 cases of intratracheal narcosis in man, of which

however, the question is decided; the method is so simple and practical, that not seldom we happen to apply it in cases where there is no necessity, but only because in animals it is simpler and safer than the usual general narcosis. Dogs, so sensitive to chloroform and so difficultly narcotized

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This apparatus has the advantage of preventing the reflex of ether in the respiratory tract, of permitting the use of oxygen instead of atmospheric air and of being applicable even to a positive pressure mask in case intubation should eventually fail or be contraindicated.

9 cases of thoracic surgery. Not a few authors have referred to cases with successful outcome; others find some objection to the method; the time has not yet arrived to solve this question here; experimentally

even with ether, perfectly tolerate the intratracheal narcosis. With an experience of more than 300 narcoses practiced with the apparatus constructed for Dr. Giordano and presented to the academy of medicine of

Turin in 1910 and 1913, and of which the second is only a more perfected form of the first,—see figure page 90,—we can affirm that this method of narcosis is not only excellent, but also the most innocuous that can be applied to animals. We have never had any deaths during the narcosis, that could be ascribed to the method even when lasting for several hours; the opening of both pleura is perfectly tolerated; post-operative pneumonia is very rare and completely obviated by interposing in the system a valve of Münke, thus certainly avoiding the reflux of liquid ether in the bronchi in case the animal performs violent expiratory efforts. We operate in the midst of almost complete respiratory immobility; the mediastinum is thus found completely accessible throughout its whole extent at a small depth; by conveniently moving our incision from one intercostal space to the other from the anterior extremity to the posterior of the space chosen, we can easily operate where it is most convenient, high or low, on the anterior or posterior mediastinum.

With the help of such a simple and at the same time so precious a technique, we have successively placed to experimental research, most of the organs of the mediastinum, trying to find out some useful data in regard to their surgery. Our purpose was to demonstrate the relative ease with which one can operate on these organs with the method Meltzer-Auer, and to establish data which may serve as a starting point for further researches. The way is already open, and as in every other field the success of experimental surgery has prepared the success of the clinic, so these first attempts can be followed by definite progress of technique which will permit us to operate in the thorax as in the abdomen and to re-

peat in the former the success that abdominal surgery has realized after the last half of the last century.

**The Esophagus.**—It is known that Biondi, Gosset and others performed incisions, sutures and small resections of the esophagus; Sauerbruch with the negative pressure and Donati with the Meltzer-Auer method, practiced the resection of the cardia and of the cardiac portion of the esophagus, pulling the stomach in the thorax and suturing it to the esophageal stump, Verson with the same method performed with success in a dog, total transpleural gastrectomy, joining the esophagus to the duodenum; Donati later practiced the exclusion of the stomach, lowering the cardia in the abdomen and joining the esophageal stump to the jejunum pulled up into the mediastinum. I, in collaboration with Dr. Giordano, have practiced an endothoracic modification of the method of Roux for esophageal stenoses, which I obtained through another useful modification of the extrathoracic method. We already were performing the operation of Roux in the following manner, which constitutes a valuable simplification of the method. At a first attempt we perform an oblique laparotomy parallel to the costal arch two fingers breadth below it; we take the jejunum and section it in correspondence to an avascular area of the mesentery and about 40 cm. below the insertion of the muscle of Treitz; then the inferior efferent stump is carried out of the abdomen and wrapped in sterile gauze while the superior afferent is grafted laterally to the jejunum about 60 cm. below the sectioned point; the laparotomy wound is then closed leaving the intestine (efferent end) hang out; then 1-2 vascular loops are sectioned and the intestine is pulled under the soft parts of the

cutis of the thorax a little to the left. In this way, feeding the animal through the intestine, the stomach is for sometime excluded from the digestive tract, which is well tolerated by the animal; in man the matter not only has no importance, but in the majority of cases it constitutes an advantage because, having to do with individuals already gastrostomized, one can continue to feed the patients through the gastric fistula. The loop adapts itself on the anterior wall of the stomach; sometimes it runs back of it but in every case it assumes in respect to the wall of the stomach, the position physiologically most adapted. After sometime it is easy through a small laparotomy wound to establish a communication between the stomach and the intestine at the point where they already have naturally placed each other in reciprocal contact; below this anastomosis one can close the lumen of the intestinal loop thus forcing the food to pass through the stomach. At this stage the operation is completed, and if the loop has done well throughout its whole extent, one can with plastic sutures unite it to the cervical portion of the esophagus. All the steps in the operation are not severe since the first, which in the operation of Roux is certainly the most serious, amounts to a simple intestinal anastomosis and the second to a gastro-entero anastomosis.

With the aid of the continuous intratracheal insufflation method, we have attempted to establish an esophageal intestinal connection *not* under the cutis of the thorax, but in the mediastinum itself, placing the intestine in the bed left by the esophagus and immediately uniting the intestine to the esophageal stump.<sup>1</sup>

The advantages a priori are evident.

1. The endothoracic method, unlike the extrathoracic, can be applied to all esophageal stenoses, even to those which by their nature require extirpation, such as the most frequent stenoses, namely the carcinomatous. In these the original Roux method could only be applied as a palliative and in such a case the disproportion between the severity of the operation and the results is very evident.

2. The endothoracic method does away with all of the difficulties of the second step in Roux's method. We know that the intestine usually remains nourished only to a little above the middle third of the thorax; hence the necessity of long, difficult and uncertain cutaneous grafting.

3. The conditions are more favorable for the normal functioning of the new esophagus, since any curvatures, which always interfere with the descent of the food, are avoided.

Naturally operating with open intestine and esophagus in a region so easily susceptible of infection such as the mediastinum, is not without risks. The results of our experience have shown us that technically the operation is simple and easy; even the joining of the esophagus to the intestinal loop is successful through a terminoterminal anastomosis with double sutures, and the healing between the two channels takes place readily; the nutrition of the loop however can only be guaranteed for the inferior third of the thorax; further up the loop may remain nourished but not always, and therefore the danger of gangrene in the mediastinum is such that in no case should one expose himself to it. The method therefore is ideal for tumors and stenoses in general of the cardia and its vicinity, but it is not satisfactory for those situated higher up, in which case however, with the aid

<sup>1</sup> Uffreduzzi and Giordano, *Zeit. f. Chir.*, No. 7, 1913. *Arch. Gen. de Chir.*, No. 4, 1913.

of the usual narcosis, one could apply the simple resection of the esophagus with suturing of the two esophageal stumps, eventually strengthening the suture with strips of fascia lata which are very well suited for the purpose. One can eventually also resort to the method recently suggested by Ach which consists in lowering the inferior stump into the abdomen and bending the superior outward, which is extracted from the neck and carefully placed in the subcutaneous tissue of the thoracic wall, where it can eventually be united to the superior stump of an intestinal loop drawn up in this region by the method of Roux.

We are now experimenting on a third solution of the problem which will notably simplify the operation.

It is known that Hirsch has proposed to substitute to the intestinal loop of Roux in the subcutaneous tissue of the thorax a piece of gastric wall, fashioned into a tube whose nutrition is assured by a peduncle which unites it to the lesser curvature from which it receives the vessels. We are trying to apply this modification to the intrathoracic method. Since the direct union of the esophagus to the stomach, in part displaced, presents inconveniences and Sauerbruch himself oftentimes observed complete hernia of the stomach in the thorax, with the most severe results, it has seemed rational to us to combine Hirsch's modification to the concept of Sauerbruch and we do not any longer suture the esophageal stump directly to the stomach, but to a rectangular limbus of it, taken from the anterior or posterior wall with its base on the lesser curvature, and then fashioned into a tube and drawn up into the mediastinum in the position of the resected piece of esophagus; the cardiac stump is pushed down.

The operation can be divided into two

parts (not two times), of which a first abdominal in which is prepared the tube of the gastric wall to be later drawn up into the mediastinum; or else it can be carried on entirely in the thorax, operating on the stomach through the diaphragm.

We can't as yet say very much about results, as the number of experiences is limited; this solution, however, seems to us to represent an advantage over our endothoracic method because the limbus of gastric wall remains nourished for a longer extent than the intestinal loop. The necessity of fashioning into a tube the gastric limbus however, requires a notable loss of time which with the other method is saved; the loss however is made good by the fact that the new esophagus is already naturally in relation with the stomach and there is no need of a new operation to establish this communication. Even the danger of infection of the mediastinum and of the pleura seems somewhat lessened.

#### **The Descending Thoracic Aorta.—**

It is especially aneurysms of the descending thoracic aorta which particularly concern us here; these although less frequent than those of the arch, are nevertheless not rare and one can readily see what an advantage it would be to be able to expose them and treat them conveniently, according to the different cases, with the very methods which modern surgery has for a long time applied with success to other arteries of the body. The difficulties are several; in the first place the opening of the pleura, which however with the method we are now studying loses, at least experimentally, all its importance; in the second place the impossibility of occluding for any length of time the vessel in order to obtain the hemostasia during the operation, and finally the great depth at which we must oper-

ate. Dr. Giordano and I have studied all those points which were open to experimental research. We have been able to determine in the first place, that the occlusion of the vessel can with no harm be prolonged for 12 minutes, with slight and passing harm for 15 minutes, and with certain and definite harm beyond 20 minutes. We have established that the interval of 12-14 minutes is more than sufficient to practice even the most complicated and longest of the operations which can be taken into consideration, namely, the circular suturing of the vessel. The small operations, aside from being short, can be performed without complete occlusion of the vessel and to this effect longitudinal and small transverse sutures are particularly adapted. Even small resections of the vessel can be practiced in the time above stated.

In regard to the depth of the vessel, we found that with intercostal section, conveniently extended backwards until it amply takes in the costovertebral muscles, we can make the vessel sufficiently accessible. In the technique we clung to what is generally used in the ordinary vascular surgery; for the occlusion we made use of Hoepfner's clamps and also of the common intestinal compressors; of these we apply two above and one below the point of operation, we apply two above because in this way the occlusive force is distributed on a more ample surface, with less harm therefore to the vessel wall. Leaving any intercostal vessels between the clamps and the point of the artery to be sectioned and sutured, risks to compromise the result because we are continually disturbed by an ebbing hemorrhage. Wishing to apply the clamps and operate in a single space is not only difficult but dangerous, because the clamp applied too near the point to be sec-

tioned slips easily and besides, the stumps do not have the necessary amplitude and mobility; we must therefore always ligate and section one or two pairs of intercostal vessels noting that the search for the branches on the right may offer some difficulty. In practicing the circular suture and in the small resections we have abandoned Carrell's technique and adopted a useful simplification of it. The application of the three points of support requires considerable and precious time and besides, a side of the triangle remains always somewhat difficult to suture. *We apply a single stitch in correspondence of the postero internal part of the circumference of the two stumps; then, having tied this first stitch, still with the same needle we suture at a single stretch, all of the postero external semicircumference of the continuous suture; then we tie again the thread. This knot is found at an antero external point exactly opposite the starting point. Having done this, we come back to our first knot and thread a needle with the thread left hanging and which was not used for the first half of the suture. With this thread we suture the antero internal half of the circumference so as to come to the second knot with whose thread we unite the second suture. In this way with a single thread we succeed in performing the whole suture dividing it in two single steps.* With this simplification not more than 8-10 minutes are needed for the whole suture; often even less.

If the technique is good, the results are excellent; no hemorrhages are observed; the lumen is not appreciably constricted and in every case there are no disturbances following. Even in unsuccessful cases where the suture had to be applied twice, if the time

limit above stated was not exceeded, there followed no bad results.

**The Thoracic Duct.**—With our experimental researches we had proposed to show first the technical possibility of tying the thoracic duct in the thorax and *second*, the innocuousness of this ligature. It is known that in many cases of subcutaneous rupture of the thoracic duct, with or without concomitant fracture of the ribs and vertebrae, the patient dies after a variable time either of cardiac or respiratory disturbances or by inanition. In fact if the chylothorax is repeatedly emptied so as to avoid compression and displacement of the mediastinum and of the thoracic viscera, the general conditions rapidly grow worse and often death follows; if one avoids puncturing, the phenomena of compression become manifest. In some cases moreover, with repeated puncture the chylothorax is transformed into a pyo-chylothorax which renders an operation necessary; from the wound the chyle flows out in such quantities that the patient often dies through inanition. From this, the indication for the early ligature of the duct in cases of subcutaneous and open lesions of the thoracic duct is evident. With the development which naturally thoracic surgery and especially that of the mediastinum, is now undergoing, operative lesions of the thoracic duct which at present are limited exclusively to its superior extent, that is in the vicinity of its opening into the innominate, will become frequent even in its intrathoracic portion.

Statistics confirm the insufficiency of expectant treatment in lesions of the thoracic duct in the thorax. Oeken reports 11 cases of lesion through obtuse violence (severe contusion of the thorax); of these, six got well and five died. To these last we must

add the case of Lindström which Oeken does not mention and which also had a fatal outcome. Of the six deaths among the 12 cases mentioned, one died through suffocation; the other five either through inanition or through phenomena of compression.

Zesas has collected 24 observations of traumatic lesion, of which four through wounds by firearms, two by stab wounds and one by puncture. In six cases there was simultaneous fracture of ribs and clavicle, in one case fracture of the vertebral column, three times simultaneous fracture of the ribs and vertebral column, seven times the lesion was due to contrecoup. Only 17 times there resulted chylothorax, once chylous ascites, and in one case both together. Of these 24 cases there were 12 deaths. If we take into account that the cases with unfavorable results are published less willingly than the others, we can understand how obscure the prognosis in such cases is, and the therapy so far used (repeated punctures, purely expectant treatment and simple thoracotomy), must be considered as insufficient. The ligation of the duct which showed itself to be so useful and rational in comparison with plugging of wounds in the neck, must find its natural application even in the thorax.

With the usual method of narcosis which permits us to amply expose the posterior mediastinum, Dr. Rinaldi and I have carried out on the dog a series of researches intended in the first place to demonstrate technically the possibility of practicing the search, isolation and ligation of the thoracic duct and to show then the innocuousness of this ligature through the sure reestablishment of a collateral circulation, and the anatomical conditions which permit this.

At the first question we have been able to answer easily. The duct could in every

case be found, isolated and ligated without any particular technical difficulties, only that the animals chosen were not too small and that the animal instead of being fasting should be operated about an hour after a full meal, in full digestion. This, which would seem an unfavorable condition for the narcosis and for the operation, was never a cause of disturbance and the animals all tolerated perfectly the operation, neither were there any lesions of near organs to be deplored. In general we incise in the seventh intercostal space for about 15 cm.; we avoid the intercostal vessels and extend our incision backward as far as the costovertebral muscles. The pleura is well opened and the seventh and eighth ribs are amply pulled apart; then the parietal pleura is incised on the left margin of the aorta and this is gently pushed aside to the right with a spatula. Behind the aorta, a little toward its right margin the thoracic duct can be easily found and is readily recognized by its transparency. It is extraordinarily delicate and we must avoid any traction on it in ligating it. During digestion instead of being transparent, it appears whitish, on account of the chyle it contains. We next inflate the lungs by increasing the pressure in the positive pressure apparatus, thus driving the air away from the pleura, and the wall is closed with pericostal stitches.

The results were very encouraging in all cases, neither chylothorax nor chylous ascites resulted; only in some cases the animals underwent a slight loss of weight without consequences.

In some animals sacrificed respectively after 3-5-7 months after the operation, we infected the duct with the method of Gerota to determine the paths across which the collateral circulation is reestablished; they are very simple. In the dog as in fact in man,

although the duct is single, yet it possesses various openings and in the remainder of its course presents some collateral branches which soon leave it to reopen into it again higher up, circumscribing the so-called insulae of Haller; in many cases the duct itself is surrounded by a regular lymphatic plexus which has direct connection with the main duct; it is across this network that the collateral circulation takes place; in every case the fluid infected in the mesenteric glands worked its way up to the ligature and then it reappeared a little higher in the duct itself, bathing some delicate collateral branches of short extent. In no case was I able to put into evidence any connection with the right lymphatic vein or any opening into the azygos veins. In every case the openings of the duct itself were found infected.

From all this we see that just as the multiplicity of openings saves us from bad consequences in ligating the duct near its opening into the innominate, so in the thorax its structure permits us to ligate the duct at any point, without any severe results following; these, especially ascites, do result when the occlusion is due to neoplastic tumors, which may not only occlude the main duct but also the small collateral branches, either because they are immediately shut off or because later with the secondary metastatic growth they become compressed so that any compensation whatever is prevented.

The ligature may be applied either at the point of lesion which often, however, is detected with difficulty, or at any point of election below that. In these cases even if we ligate the duct only below the lesion, with the reestablishment of a collateral circulation, chylothorax does not appear, as we were able to repeatedly demonstrate by

ligating the duct and sectioning above the ligature.

We believe therefore that, given the simplicity of the operation and the severe risks of expectant treatment, there is for lesions of the duct in the thorax, as for those in the cervical region, a distinct indication to operate and ligate the duct itself. And with the development of mediastinal surgery examples of this operation, either in traumatic or operative lesions, will not be long in appearing.

**The Pulmonary Artery.** (Operation of Trendelenburg).—The operation of Trendelenburg has not had a definite approbation in the clinic; in many cases an improvement in pulseless and unconscious patients has been observed; in one case the patient lived four days but in no case was there a definite recovery. Yet the operation is fundamentally justified and experiments can't help but integrally support all the principles. The occlusion of the aorta and the pulmonary artery with the rubber tube is tolerated for 30 seconds and even more; with the shrewdness of Läwen and Sievers this interval of tolerability can be prolonged still more.

This time is sufficient to incise the artery and extract the emboli; the suturing of the artery may then be accomplished tranquilly, after having applied to the wound a special fenestrated hemostatic clamp which permits us to perform the suture after the rubber band occluding the aorta and pulmonary artery has been removed. In this clinic, with the usual narcosis, several operations were performed on the pulmonary artery of the dog, among which repeatedly and with success, that of Trendelenburg, in the part at least where it could experimentally be reproduced. Giordano and Rodano have abandoned the costal resec-

tions and have substituted them with a single incision in the third intercostal space, which permits one to amply expose the pericardium and the pericardial course of the two great vessels when the pericardium has been duly opened. They incise the pulmonary artery transversely (having first caused ischemia of the two great vessels with the rubber band simply pulled and not knotted) for one cm. and then with a pair of forceps they search for a few seconds the branches of the artery. The wound is then rapidly closed with a suitable fenestrated hemostatic clamp and in the opening of this the arterial wound is closed with a simple suture, eventually with some Y stitches of Jaboulay. With this technique no more bad results take place and the time for the search of the emboli can be prolonged for more than 30 seconds. Therefore it is perhaps not risky to hope for more lasting success even in man, provided that in the particular case we are not dealing with emboli too minutely diffused in the small ramifications of the vessel.

**Superior and Inferior Venae Cavae.**—The great difficulties experienced in attacking through the pleura, these large venous trunks, have always rendered troublesome the study even strictly theoretical, of the effects of ligating the superior and inferior venae cavae, and therefore uncertain the results of the scarce experiences. With the intrathoracic method, after having been able to practice sutures of more or less ample lesions of these vessels, Giordano has studied the effects of ligating the superior vena cava, and with Chironi that of the inferior vena cava.

For the technique and the details I refer to the special publications but in regard to the inferior vena cava I wish to point out a fact which these last researches have

succeeded in determining. It is known that the closing of the vessel is the more rapidly fatal the higher it is accomplished, and more exactly, according to the involvement of one or both renal veins and the hepatic veins. This fact was explained by former experimenters as due to the exclusion respectively of the renal and hepatic function. Death however in every case takes place so rapidly that we cannot at all attribute it to the suppression, for instance, of the kidneys, because it is known that animals, including man, can survive a long time.

The cause of death is not due to chemical causes but purely to mechanical ones, namely, to the subtraction of a considerable column of liquid which is the more considerable the higher the vein is ligated. The quantity of blood which reaches the heart becomes insufficient for the explication of the mechanical function of the heart, and from that there follows death.

**The Vagi and the Intercostal Nerves.** (Operation of Francke).—The possibility of attacking the vagi in the thorax has permitted us to answer an interesting question of experimental pathology, namely that of the experimental production of gastric ulcer. It is known that in the last few years our concepts on the pathogenesis of gastric ulcer have undergone modifications and the theories which study the antipeptic power of the gastric wall, that is the power of defending itself against the digestive ferments, be it localized in the gastric wall or diffused in the blood serum, the gastric wall only having a special power to fix the substances with which the power itself is manifested, acquire increasing favor. Yet, the controversy among experimenters is not settled and with the above theories the resection of the vagi in the pathogenesis of experimental gastric ulcers, has not lost all

its importance. There remained the doubt that sectioning the vagi in the abdomen would produce such and so many lesions of vessels that the results seemed obscured; resecting the vagi in the thorax would eliminate every doubt. In this clinic Dr. Antonini was able to obtain, though rarely, some gastric ulcers resecting the vagi above the diaphragm.

The explanation of the rarity of positive results is not difficult when we think that resection of the vagi even in the thorax can only rarely be complete since there are delicate fibers of the vagus in the wall of the esophagus itself which are not resected. This explains the fact confirmed by us, that resection of the vagi, coupled with resection of the esophagus, besides the severity of the operation in itself, generally gives us positive results on the part of the vagus; Verson in the operation of total gastrectomy via endothoracica, has at times observed disturbances due to resection of the vagus. In the case of Lapeyre who practiced on the dog double vagotomy without esophagotomy, no disturbances followed. He noticed no complications on the part of the heart or respiration; he doesn't even mention any complications on the part of the stomach.

In regard to the operation of Francke, we reserve our judgment on its clinical value; the discussions on the subject are known to everyone; it is not yet well established whether by taking away the intercostal nerve one succeeds in removing the ganglion and in every case the operation does not seem to affect the seat of trouble so that the patient still feels gastric pain as the man whose leg has been amputated, still refers the pain to the lost limb. Whatever be the clinical value of the operation, I only wish to point out that it can much more

simply be accomplished in the thorax, with the advantage of being able to look for and follow still more easily the intercostal nerve than by proceeding from without where it is necessary to reach to great depths with considerable hemorrhage from the neighboring muscles. The inconvenience of having to open the pleura is very slight if the necessary precautions are taken and is all the less appreciable in so far as all observers agree in affirming that often it is opened unintentionally and therefore with more severe risks even operating from the outside.

Dogs tolerate very extensive intercostal resections which with the Meltzer-Auer method can be performed at a single operation since the opening of both pleura is innocuous. In no case however, can we remove the intervertebral ganglion, at least completely. Whereas macroscopically the contrary might seem to be true, histological examination will convince us of our error.

Experimental surgery which is held of less importance by some, has prepared for the clinic in many fields, lasting and fruitful success. Suffices to remember the surgery of the thymus which as Klose well says, is due to the intense progress and to the fruitful union of experimental with clinical surgery. In no field as in the surgery of the thorax must experiments and practice be coupled in order to give useful and lasting fruits; and if the observations of the surgeon at the bedside of the patient offer new problems to solve, these only with experimental studies shall find the solution of useful results even for the clinic.

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**Vinegar to Reduce Fever.**—I have found vinegar an excellent substitute for alcohol (*The Nurse*) when a sponge is necessary to reduce fever.

## THE PREVENTION OF HEART DISEASE IN RHEUMATIC CHILDREN.

BY

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The series of articles published in the June issue of AMERICAN MEDICINE, and dealing with the various aspects of rheumatic disease, may be regarded, I suppose, as a compendium of modern doctrine and modern practice. Nevertheless, I venture to suggest that in relation to the prevention of heart disease in rheumatic children there remains an important point which still requires emphasis. It is to this point I here desire to draw attention. Whatever differences modern writers on rheumatism display on matters of detail there are certain broad propositions where all are in substantial agreement, and my present proposal is that from these accepted propositions there issues a conclusion which has hitherto been largely neglected. To state in general terms the doctrines which are almost unanimously accepted, it is agreed that there exists an acute febrile disease, not uncommon in adults, distinguished by polyarthritis and free sweating, apt to be complicated at times by cardiac lesions, and known generally as acute rheumatism or rheumatic fever. Further, it is accepted that the same disease presents itself in children, but here the arthritic incidents are usually inconspicuous, while such conditions as tonsillitis, chorea, subcutaneous nodules, etc., are frequent symptoms, and the risk of heart complications is very pronounced. In a word, acute

rheumatism in the adult is mainly an affair of the joints with some risk of cardiac mischief, while in the child the manifestations of the disease are chiefly non-arthritis and heart lesions are a common result. Such, in summary, is the teaching which, in 1889, was urged on the profession by the late Dr. Cheadle in his lectures on "*The Rheumatic State in Childhood*," where, it is only justice to say, the argument is presented with an engaging modesty and persuasiveness and is supported by a serious study of clinical details. Later writers, including the contributors to AMERICAN MEDICINE, have, for the most part, adopted Dr. Cheadle's doctrines, and the statement that the profession has only learned them "quite recently" must be limited to those who have failed to study the small volume in which they were originally set forth.

From the general position just stated there emerges the following question: Can any suggestion be proposed which will explain why heart disease is so much more frequently one of the consequences of rheumatism in the child than it is in the adult? To give an absolutely confident reply to this question is doubtless impossible, but I venture to repeat here, what I have more than once advanced, namely, that possibly, or even probably, it is in the absence of painful joint conditions from the rheumatism of childhood than an explanation may be found. For such absence means, only too often, the neglect of the early and complete rest which admittedly is the influence most likely to save the heart from the prejudicial action of the rheumatic poison. This rest is imposed on the adult by the painful condition of his joints. But the non-arthritis rheumatism of the child exercises no such compulsion, and this more especially in the poorer classes of the people, where the cir-

cumstances of the home hardly admit careful attention to what on the surface appear to be but minor ailments. Hence, not infrequently, the child with active though unrecognized rheumatism receives little or no attention until either the persistence of his complaints or the development of obviously severe symptoms compels resort to medical aid. In other words, the child, in the early manifestations of the disease, often avoids the rest which the adult must needs accept and which is recognized as the measure best calculated to save the heart from rheumatic disaster. The position therefore in brief is: the adult is driven to early rest and he comparatively rarely suffers from heart disease; the child, on the other hand, frequently escapes this discipline and in him heart disease is common. Such are the facts, and in view of them it is surely not a presumptuous thing to say that the influence of rest in the one case, and its absence in the other, may afford at least a partial explanation of the relative infrequency of cardiac disease in the rheumatism of the adult and its large incidence in the rheumatism of the child. Yet, even if this proposition be challenged, it will not be denied that early and complete rest is desirable in the non-arthritis form of rheumatism, just as it is desirable in the arthritic manifestations of the disease, and that alike in one and the other it is in this direction we must look for the prevention of cardiac mischief. Hence, hypotheses and speculations apart, it remains true that there falls on the medical profession the responsibility of securing for rheumatic children—so far as this is possible—the protective influence of early and complete rest during the various active though undemonstrative manifestations of the disease to which such children are liable.

Now it is obvious that this highly desir-

able end will only be attained when the parents or guardians of rheumatic children understand the risks which their children run, and parents and guardians can only be led to this understanding by information given to them by the medical practitioner. The lay conception of rheumatism is one of pain in the joints or muscles, and there is a general recognition of the possible association of these pains, at least when they are more or less acute, with rheumatic disease of the heart. But no such risk is recognized in the rheumatic incidents of childhood because, to the layman, these incidents do not mean rheumatism. Every children's hospital receives, almost as a daily experience, some unhappy child in whom there are conspicuous evidences of cardiac valvular disease although the mother protests, and in all good faith, that the child has never had rheumatism. The explanation of course is that the "rheumatism" has occurred in a form not identified by the uninstructed observer. Clearly the only way to avoid so tragic and so frequently repeated a situation is to explain in advance to those responsible the danger which may attend the slighter ailments of the children under their care. And this in practice must mean that any incident in a family record which indicates the existence of a rheumatic inheritance ought to be the occasion for the warning here suggested. The youthful victim of, say, mitral disease is unhappily past preventive effort. But the alarm thus sounded, provided it is translated into plain terms by the medical practitioner, may do something to protect the other members of the same generation. Or, to put the argument in its least assertive form, the recognition in a patient of a rheumatic event, whether valvular disease or some other, may, if properly utilized, gain for the other

members of the family, and especially for those of tender years, the early and complete rest which is the best known protective agency against the development of rheumatic heart disease. If this position is a sound one, a great responsibility rests on medical practitioners, and more particularly on those who cultivate general practice and thus have the advantage of an intimate knowledge of the medical events and tendencies in the families of their patients. Whether here, or in hospital practice, the claim remains good that children with a rheumatic inheritance ought to have what protection early and complete rest will give them whenever they suffer from one or other of the manifestations of active rheumatism. This protection they will not have unless the parents are warned in advance. An occasion for such warning arises whenever evidences of a rheumatic inheritance are displayed in any member of the family. The one person who recognizes the full meaning of these evidences, alike to the individual patient and to the others, is the medical practitioner. To him is the opportunity; on him therefore falls the responsibility. Were this opportunity and responsibility universally taught and recognized it is possible that many children would be saved from the disaster of rheumatic heart disease. They would at least have such protection as early and complete rest can give them. So far the profession has no other available means at hand and therefore the more incumbent is the duty to see that what protection rest can afford is fully utilized. This can only be secured when parents and guardians in families where rheumatism has once betrayed itself are warned of the dangers which even the slight illnesses of their children may enclose. Prevention proverbially is better than cure. The medical profession has acted

energetically on this creed in various directions and can number successes not a few. If, to these, heart disease could be added the triumph would be great. Perhaps the method here proposed does not offer a very large promise. But it offers some promise. Moreover, it has no competitor, and until an alternative is proposed it is the plain duty of the profession to utilize to the full the one measure of protection which can be enforced. When parents are cautioned in time, there will be some chance of gaining for the non-arthritis manifestations of rheumatism in childhood the protective influence of the early and complete rest to which the presence of pain in the joints necessarily compels the adult. In any event, such warning will meet the responsibility which the possession of knowledge inevitably imposes on the medical profession and which it must be the ambition of the profession adequately to meet and discharge.

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## THE MANAGEMENT OF FUNCTIONAL NERVOUS AFFECTIONS<sup>1</sup>.

BY

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**General Considerations.**—Nervous diseases are often called functional because structural changes have not been demonstrated. Some physicians maintain that an organic change is present in every disorder, using the term functional to imply a lack of knowledge. I wish to protest against that attitude.

We will not speak now of any disorder of

function due to actual physical changes in the nervous system itself.

Functional nervous diseases are of two kinds, those due to a disordered reaction of the nervous system because of disturbed metabolism from improper nutrition or deficient secretory conditions; and those disturbances of nervous reaction without any physical disorder, but in which the orderly reactivities of the arrangement of the nervous system into functional systems are not accomplished because of some manner or trend of direction in which they are orientated. These we call psychogenic disorders.

Psychogenic disorders are illustrated in Pavlow's dogs with gastric fistulae. He showed that a dog normally secretes gastric juice when he is shown a piece of meat, and that having heard a bell ring at the same time, the dog learns to associate the two events so that when the bell is rung, the dog's gastric fistula secretes gastric juice just as when shown a piece of meat.

That is a "conditioning" of a reflex; but it is not the ringing of the bell in itself that causes the secretion, but the *idea* that the dog has of the *meaning* of the bell—a psychological process—which causes it to have an emotion of pleasurable anticipation which leads to the flow of gastric juice.

A whip being shown, the flow of gastric juice was inhibited as a result of the stimulus of fear; because the dog realized the meaning of the whip, bringing an apprehension of impending pain and fear thereof, and it was the meaning (which is a psychological factor) which prevented that dog from secreting gastric juice.

These experiments, together with Cannon's proving that fear causes hyperadrenia in cats and Crile's proving that fear can kill, illustrate how psychological processes in-

<sup>1</sup> Read before the Southern Medical Association.

fluence bodily reactions. They correspond to some of the clinical facts, and leave no room for scepticism as to the real efficacy of psychological reaction.

### **1. Disorders of Physical Origin Often Comprised Under Neurasthenia.—**

In studying those functional nervous conditions having a physical source we must refer to that old "waste-bag", neurasthenia; not, however, in the sense of psychological disturbance used by some writers—Dejerine, Raymond. Neurasthenia is a syndrome, often of complex causation, of which exhaustion is the chief feature, accompanied or not by pains and other symptoms. It is not a clinical entity.

Etiologically speaking, there are various types of so-called neurasthenia, as for instance:

- (a) The middle-aged neurasthenic, who nearly always has some physical deterioration disorder.
- (b) The tubercular neurasthenic.
- (c) The neurasthenic with disorders of the internal secretions.

In the middle-aged type the sphygmomanometer will detect a large number of cases with high blood pressure; and many will be found with renal disorders even short of the exhibition of hypertension in the blood vessels.

Hypertension itself is merely one of the signs of toxicosis, as is shown in such patients, when they reach a more advanced stage, by clinical and pathological manifestations definitely due to failure of proper metabolism of proteins. We know in therapy that many such patients are immediately relieved when there is a limitation of the intake of food protein, and we are beginning to think, since going more into the study of the subject, that it may not be a matter of quantity of protein but a

matter in part of the kind of protein, which to certain persons is toxic in that respect; just as we know that there are other than food proteins which are toxic to various parts of the body. This subject is new and is yet to be worked out in detail; but it is not new that we can by appropriate dietetic therapy keep many of these patients comfortable for a great number of years.

*Case I.—So-CALLED NEURASTHENIA FROM METABOLIC DISTURBANCE.*—An example is the case of an engineer, 35 years old, referred by Dr. Atkinson, who had obsessions, could not concentrate on his work and fell asleep over it, and believed that he was losing his mind. Since leaving active field work he had been doing only office work for three months, and had the usual syndrome of disordered metabolism in a robust man when his intake of protein was not properly limited. Where the diagnosis was properly made and the carbohydrates and salines increased and the proteins limited (*Monthly Cyclo.* 1911) he was well in a week and has remained so five years.

*Case II.—THE EFFECT OF CHRISTIAN SCIENCE.*—A similar case refused to consult a doctor, adopted Christian Science, and finished up with suicide in six months, due to a toxic condition which would have been easily removable by dietary.<sup>1</sup>

The tubercular neurasthenics were spoken of by Dr. Haskell of Bridgeport, who found a large number of them among the dispensary ambulant "neurasthenics."

Dr. Head of Minneapolis (*A. M. A.*) found that many well-to-do neurasthenics were tubercular, and he believes that such cases were numerous among those benefited by Dr. Weir Mitchell's well-known methods.<sup>2</sup>

The "nervousness," the syndrome of erythema with psychological excitement in hyperthyroid patients is now well-known as is also the depression of hypothyroidism which, in elder people, is often overlooked.

In dysthyroidism the peculiar recurrent states of neurasthenia, great prostration,

<sup>1</sup> Nervous Symptoms Preceding Arteriosclerosis, *Month. Cyclo.*, 1911, also *Lancet Clinic*, Cincinnati, 1915.

<sup>2</sup> *Jour. A. M. A.*, Sept., 1914.

and inability to concentrate have been well described by Dejerine.

Pituitary disorders, too, create neurastheniform symptoms.

Insufficient secretion of the adrenal gland produces the clearest and simplest type of neurasthenia, characterized by extreme asthenia, and inability to think clearly, discouragement in consequence, accompanied as a rule by low blood pressure. ("The Syndrome of Adrenal Inadequacy." *J. A. M. A.*, 1914, Dec.) also in *Archives of Diagnosis*, Oct., 1915.

**Treatment of Physical Causes.**—Now the therapy of all these different types should obviously not be the rough empiricism of the so-called rest cure, but should be directed to the cause of the condition.

There is a toxic condition without exhaustion, but rather causing restlessness and excitement and called by the laity nervousness or nervous temperament or disposition. It is frequently caused by caffein. *Arch. of Pediatrics*. A case of post caffieic psychastenia in a child aged two, 1911.

It often shows itself in children by a wiggling, a twitching or tic. Psychologically, there is a feeling that the time is out of joint; nothing goes right, that things are all wrong. Later on, if the condition remains chronic, the person does not recognize that it is his ideas of reference that are wrong, there is a pessimistic tone. These ideas of reference may become the foundation of paranoia.

But even when a physical condition which has caused restlessness or a habit of jerking subsides, the habit may persist, and the patient who has learned to jerk his shoulder because he has a tight coat may go on jerking his shoulder from habit for the rest of his life. Such patients will require for their therapy, psychological measures, just as some cases which originated psychologically require physical measures; also see Treatment of Psychoneurotic Patients, Cleveland Academy of Medicine, July, 1915.

**Psychological Causes.** Illustrated by cases of writer's cramp, traumatic neurosis, suicidal impulsion, etc. We now come to a consideration of the mechanism of the cases which originate psychogenically.

**Case III.—WRITER'S CRAMP.**—A man, referred by Dr. Williams of Boston, had been unable for one month to write his name clearly on account of a tremor. We know

tremor is a symptom of toxemia or of nervous disease; but this man could draw without trembling, which he could not do if his neurons were diseased or intoxicated, so we concluded that his tremor was psychogenetic. On analysis we find that the first time he trembled was when he returned to work after a surgical operation before he was fit. The bank did not recognize his signature, and apprehension of this caused him to tremble thereafter when attempting to write. Reeducation led to his cure in a month, after one visit. (*N. Y. Med. Jour.*, March, 1911).

**Case IV.**—A woman of 40, referred by Dr. Little, was proud of her speed in writing, found herself unable to write legibly because she was occupied by anxiety for her children who had scarlet fever. She was cured after the mechanism was worked out. (AMER. MEDICINE, July, 1912).

The details of cases are embodied in full reports referred to in parenthesis. (Also *Jour. fur Neurol. u Psch.*, Leipzig, 1912 Bd. 19).

It is useless to treat such functional nervous affections by massage, electricity, rest of the part, and the distractions of travel, as these measures do not meet the real issue of not being able to write, and until that is analyzed and the patient shown the methods, all other therapy is meaningless.

Another instructive type of functional disorder, often too an occupational one, is the traumatic neurosis.<sup>1</sup>

**Case V.—TRAUMATIC NEUROSES.**—A railway brakeman, seen with Dr. S. S. Gale, N. & W. Ry., had his back injured severely and was laid up for a week. He feared spinal disease; six months later he was still on crutches, in pain, with anesthesia up to the hips, had lost 20 pounds in weight, complexion sallow, eyes dull, frequent attacks of weeping and extreme dejection, a hopeless outlook, simply because he believed he was damaged for life. This case is reported in full—*Med. Record*, May, 1909.

Examination showed there was no lesion of the spinal cord or of the peripheral nerves. His sensibility and motility were impaired only because he did not believe he could feel or walk, his emaciation and sallow tint were due to depression of mind which hindered sleep, appetite and assimilation.

<sup>1</sup> The Traumatic Neurosis, *Amer. Jour. Med. Sc.*, Oct., 1914.

He was restored to health in a month after one interview in which the condition was explained to him.

**Case VI.**—A farm lad, 24 years old, seen with Dr. A. B. Hooe in Washington, without any physical manifestations of disease endeavored to commit suicide four times. Analysis of his psychological content showed that he felt ashamed because he was not successful at school nor afterward in farming. He thought he was different from other boys, and felt humiliated because he feared that his brain was injured by self-abuse. After this was explained to him clearly he was at once relieved of the desire for self-destruction. (*Prevention of Suicide Am. Jour. Insanity*, 1915).

**Case VII.—GASTRIC NEUROSES.**—In Déjé-rine's book is a masterly exposition of this much misunderstood disorder. A woman, seen with Dr. Jackson, with nervous dyspepsia was becoming more and more anxious, nervous and disturbed, and was thin on account of worry. She believed that she had a weak stomach and must follow a certain dietary; it became a fixed idea. She had the idea that she could not digest and hence would not eat. The treatment of these patients is to persuade them that they are in reality capable of digesting nourishment, but they find it hard to believe that the trouble is not in the stomach itself because they are called dyspeptic by physicians. Those are the cases for whom isolation is most applicable. The pathogenesis is outlined.—*Jour. Abn. Psych.*, 1908 and *AMER. MEDICINE*, 1909.

**Case VIII.—HYSTERICAL APPENDICITIS.**—A woman, seen with Drs. Watkins and Stavely, whose appendix had been removed two months before had pain in that region. It was, in reality, an apprehension of further pain and was cured in two hours when she was persuaded that it was purely imaginary.

**Case IX.—ILIOPSOAS SPASM CONSEQUENT UPON APPENDICITIS.**—Another patient, seen with Dr. I. S. Stone, had persistent pain after appendectomy because of a constant reference by the patient to the region formerly painful which produced a spasm of

the iliopsoas and oblique abdominal muscles.

Reeducation in relaxation of muscles in general, then of those affected, was the treatment. (*Visceral Pain, Surg. Gynecol. and Obstetrics*, 1910).

**Neurotic Children** (see *Am. Jour. Med. Science*, Oct., 1912). (Also *N. Y. Med. Jour.*, Jan. 8, 1916).

**Case X.—A CASE ILLUSTRATING THE MECHANISM OF TICS AND INSOMNIA BY SUGGESTION.**—A child, seen with Dr. Perrie of McKendree, Md., had a series of tics consisting of smacking of lips and bending down, touching the floor; resulting from her desire to avoid hurting others with her breath which she believed was noxious, and to avoid hurting the floor with her hard heels.

Therefore she applied the "healing kiss" to the air which she expired, and "the healing touch" to the floor. After these had been removed in a sanitarium she was thought to be too nervous for school, especially as she could not sleep for hours after her mother attempted to teach her. In reality this child was not "nervous" at all.

She was neither apprehensive, nor fidgety, nor irritable, nor of a difficult temperament. She had stayed awake by suggestion, because her parents had let her see that they were afraid of it. The matter was explained to her and to the parents, and the child has since attended school and remained perfectly well. (*Wash. Med. Annals*, Vol. XII, No. 1).

There are many cases in which the discovery of the etiology is not of great therapeutic importance, but where psychological habits require to be dealt with by special measures which Brissaud has called psychomotor discipline or reeducation.

**Case XI.—TIC CURED BY PSYCHOMOTOR DISCIPLINE.**—A striking case was that of a man referred by Dr. T. C. Martin because of a grunting noise which he made with respiration while at the same time he bent his body. This was a bowing tic. Physicians had recognized its functional character and had used methods of suggestion without success. I reasoned that sudden contractions of the recti muscles and diaphragm caused the tic, and that if the patient could be taught control of those muscles the movements would necessarily cease.

He was shown how to perform contraction of the recti and diaphragm, and when he was voluntarily moving his muscles he could not perform the tic; when he voluntarily contracted the diaphragm he could not make the grunting noise. He was cured in two sittings.

**Conclusion.**—Treatment of functional nervous disorders is ineffective which does not take account of the etiology, or which applies such crude measures as "suggestion," massage, electricity, distraction, rest, isolation and feeding. This is no better than the method of Christian Scientists or osteopaths or chiropractors who treat them by suggestion applied in ignorance without knowledge of the etiology.

Suggestion in psychological cases does only harm by exalting the patient's suggestibility, which it should be our object to remove. If we adopt it in therapeutics we are merely using an inferior method which the charlatan can use more effectively, for the Christian Science suggestion is clothed in the cloak of religion, which gives it a tremendous appeal, it also gives a definite something to hold, "there is no such thing as disease," so that it has in it something philosophical.

Even massage, a useful means in conditions of asthenia, must be applied in accordance with definite indications in physical cases, but not used indiscriminately.

We have then to distinguish the genetic factor in each case, and when possible, to direct our attention to that in order to remove it.

When this is not necessary we must get rid of the effect of that initial cause in cases of physical disorder by the appropriate medical measures we possess and in cases of psychological disorder by creating a mechanism whereby the psychological reactions

are reestablished in harmony with the environment.

1705 N. St.  

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## MINERAL OIL PHYSIOLOGY.

BY

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No therapeutic agent should ever be administered to a patient unless that agent is in perfect harmony with the physiological functions of the organ to be affected.

Constipation or obstipation is not a disease but a symptom of a perverted physiological function. It is perfectly physiological for food residue to enter, to remain for a reasonable time and then to pass through the intestinal canal.

There is no *normal* time set for all of these factors to happen in. It may be within the limit of normal physiology for a certain individual to have a bowel movement but once every five or six days; it is equally possible for another individual to have such a movement twice every twenty-four hours.

Food taken per os has remained within the intestinal tract for four weeks, again under personal observation I have seen food administered per os leave per rectum within twenty minutes from the time of taking.

When there are present clinical manifestations of toxemia as a result of retention, or when the retention in the intestinal canal

produces discomfort by mechanical distension it should be interfered with.

The most common cause of retention is inflammation of the colon with a more or less temporary abeyance of the function of the mucous membrane which is to secrete mucus.

The physiological function of the mucus in the colon is to mix with and soften the fecal matter, to cover the lumen of the colon, thereby facilitating the onward passage and prevent injury to the wall of the mucous membrane.

When the stool is of proper consistency and covered on its periphery with mucus the colon is performing its normal physiological function. When the stool is dry, not formed and not coated with mucus on the outside a substitute for the mucus must be administered.

Since abnormal retention causes gastric and colonic dilatation which if unchecked is followed by atony and atrophy the therapeutic measure employed should be an agent which not only substitutes the physiologic action of mucus but at the same time exerts a stimulating influence upon the dilated organs.

Petrolatum liquid is the substance above all others that lends itself as a physiological substitute for mucus. This oil in its proper state is tasteless and odorless, does not undergo putrefactive changes, is not absorbed by the system, does not irritate the lumen, mixes readily with the feces, lubricates and protects the mucous membrane, in short, does just that which should be done by the normal mucus and does nothing more.

The specific gravity together with viscosity of the oil used are of the greatest importance; if these are too low, the oil not only fails to be held with the feces but hurries through the canal and escapes per rectum;

if on the other hand the specific gravity and the viscosity are too high it then simply acts as a lubricant in the spots and places that it happens to come in contact with.

The specific gravity of the oil most suitable for physiological purposes should be according to the *British Phar.*, 860 at 60° F. The fact that most of the essential oils exert a reflex contracting effect upon the hollow viscera should be taken advantage of for two reasons. *First*, to re-contract a dilated stomach or colon, *second*, for the purpose of adding palatability to the otherwise bland and tasteless oil.

Among the more desirable essential oils to be used for this purpose is the oil of peppermint; even the laity know the stomach contracting power of a few peppermint lozenges; oil of cloves, oil of cinnamon, oil of betula, these three oils not only exert a contracting gas expelling effect but they are highly sedative to an irritated mucous membrane. Last, but not least we have the oil of bitter orange; this oil in a superlative degree exerts a reflex contracting effect upon the stomach in such a marked manner that anesthetists take advantage of this fact and by mixing it with the ether not only impart a pleasant flavor but by keeping the stomach contracted prevent much of the post anesthetic vomiting.

An oil therefore that is intended as a therapeutic agent must be of the mineral variety to prevent its being absorbed. This at once shows the fallacy of administering a mineral oil for any other except lubricating purposes.

This mineral oil need not be the Russian, Galician or any other imported oil, but may be an American product, so long as it is sufficiently purified of foreign ingredients.

Redwood states that "comparison of results obtained with American, Galician and

Russian petroleum shows that the same classes of hydrocarbons—the paraffins, the polymethylenes or naphthalenes, and aromatic hydrocarbons—are present in the petroleum from all three sources, but that the relative amount of naphthalenes and in all probability of aromatic hydrocarbons is greatest in Russian and least in American petroleum." AMERICAN MEDICINE, Dec., 1914.

Marcusson claims that, of stable saturated hydrocarbons which react with fuming nitric acid, the Russian oils contain a higher percentage than the American oils.

I have tested a number of samples of the various kinds of mineral oils on the market.

Some had to be discarded on account of the specific gravity being entirely too low; others were rejected because there was too much fluorescence present with a distinctly naphtha-like odor.

Eight samples which came within the physiological requirements as far as specific gravity, nonfluorescence and odor was concerned were subjected to the sulphuric nitric acid and water bath test. Five of these proved too high in hydrocarbon percentage, one was not sufficiently neutralized and contained sulphur compounds.

Only two of all the samples were entirely satisfactory as far as physiological requirements were concerned; I am also pleased to say that both of these samples were of American product.

231 W. 96th Street.

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**Cider**, which is harmful for recently affected gouty patients, is useful in old standing cases; that is to say, in gouty patients with hyperacidity.—Barot (*Treatment*).

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**Topical applications** of equal parts iodine and glycerin (weaker if painful) will abort and quickly cure many acute inflammations about the nose and throat. (*Med. Fortnightly*). Useful also in chronic forms.

## EXTRA-UTERINE PREGNANCY<sup>1</sup>.

BY

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In presenting the subject of extra-uterine pregnancy, I feel that although very much has been written on the subject, yet a little reminder to the general practitioner, from time to time, may not be out of place; for this condition very often occurs with such suddenness, that a prompt and accurate diagnosis becomes imperative, and unless surgical interference is at once instituted a precious life may be lost.

Extra-uterine pregnancy has always been a subject of profound interest, for the reason that it will exist for a time without any definite symptoms, until a tragic period arrives when with the occurrence of either a rupture of the gravid tube, or an expulsion of the products of conception through the fimbriated end of the tube, takes place; with its accompanying hemorrhage, shock and collapse, demanding most skillful handling of the case on the part of the medical attendant.

Extra-uterine pregnancy is generally classified as tubal, ovarian, or abdominal, and tubal pregnancy may be again subdivided into interstitial, ampular and isthmic, the latter two being most frequent. However clinically, no such distinction can be made with any degree of certainty; they all give the same symptomatology, and demand the same treatment.

**Etiology.**—Impregnation of the ovum taking place in the tube, anything which will interfere with the passage of the im-

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<sup>1</sup> Read before the Clinical Society of the Beth David Hospital, (December 16, 1915).

pregnated ovum through the tube, will cause an extra-uterine pregnancy. Arranged in order of frequency, they are: 1. Result of inflammatory changes in the tube, denudation of the ciliated epithelium strictures of the tube, distortions due to perisalpingitis and pelvic peritonitis, ovarian, paroovarian, and intra-ligamentous cysts; tumors of ovary, polypi of the tube, congenital abnormalities of the tube, as diverticuli and rudimentary fimbriae. The occurrence of an ectopic in an apparently normal tube, is explained by Webster on the theory that there occurs a genetic reaction in a part of the tube causing the ovum to find lodgment there. Bandler, Gottshalk and Firnwald state that gonorrhea is a frequent factor of ectopic pregnancy. Brothers claims an unusually large number of his patients gave evidence of a previous uterine and adnexal inflammation and many of them a distinct gonorrhreal history. Duhrsen, Mandl and Peterson claim that two-thirds of their cases gave a gonorrhreal history.

Interstitial pregnancy occurs very infrequently. According to Martin, it occurred but once in seventy-seven cases. Kelly saw none in one hundred and thirty-nine cases. Lawson Tait saw one in one hundred cases. The most common is the ampular and isthmic type.

Coincident with the discharge of an ovum from a Graafian follicle, the uterine mucosa undergoes hypertrophy, in anticipation of the implantation of the ovum, when the ovum becomes fertilized, the uterine mucosa becomes converted into a decidua, regardless of whether the ovum develops in the tube or uterine cavity. When however the ovum develops in the uterine cavity, the decidua further develops into the decidua vera, serotina and reflexa; but when the ovum develops in the tube the decidua un-

dergoes degenerative changes, and is discharged either in shreds, or as a complete uterine cast. While some lay great stress on the diagnostic value of the findings of an uterine cast, Kelly observed only three in one hundred and thirty-nine cases and Ladinski noted only two in one hundred and seven cases. With the lodgment of the fertilized ovum within the tube, the tube becomes swollen, more vascular, thinned and distended; when the ovum finds lodgment near the fimbriated extremity, the ostium abdominale often becomes occluded; when it remains patent the pregnancy is more apt to terminate in tubal abortion. However in some cases, in spite of a patent ostium abdominale, rupture of the tube occurs.

Hemorrhage usually takes place between the ovum and the tubal wall, causing a complete or partial separation of the ovum, with a complete or partial destruction of the trophoblastic layer. When the ovum becomes completely separated, it may be carried away with the blood, through the abdominal osteum or remain in the tube as a mole.

Tubal pregnancy may terminate by 1. Expulsion into the uterine cavity; if it was originally of the interstitial variety; this however is questioned by a number of authorities. 2. Tubal abortion or expulsion of the ovum through the abdominal osteum as noted above. 3. Tubal rupture which may be either intraperitoneal, or extraperitoneal as when the rupture occurs between the two layers of the broad ligament. 4. The ovum may be extruded, the placenta remaining firmly attached to the tube resulting then in an abdominal pregnancy.

When the hemorrhage accompanying either the tubal abortion or tubal rupture is not excessive and it stops, a hematoma forms; which may in time be absorbed, or

may become infected giving rise to a pelvic abscess which if not relieved by drainage at the hands of the surgeon, may rupture into the rectum or bladder and patient be cured spontaneously. Occasionally a hematoma may go on to calcification and remain for an indefinite period.

When the ovum is not completely separated the hemorrhage may be slight or severe and in the latter case, should it have followed a number of smaller hemorrhages, the patient's recuperative power may be so reduced, as to make the outlook of the patient's recovery extremely doubtful. A pelvic hematocele may be formed behind, to either side, but rarely in front of the uterus.

Relative frequency of tubal rupture and abortion. According to Ladinski there occur twice as many ruptures as abortions. Rupture of tubal pregnancy usually takes place between the sixth week and the fourth month of gestation.

The rupture of the tube is usually caused by the destructive action of the trophoblastic cells, as well as by the thinning and the distension of the tubal wall.

**Symptoms.**—1. Amenorrhea may or may not be present. Ladinski claims that it is invariably present except when pregnancy occurs during lactation. In fifty-three cases reported by Vineberg five cases had no period of amenorrhea, eight cases had irregular bleeding either in amount or time; forty cases had an amenorrhea of a few days or over. In a series of cases reported by Brothers amenorrhea was absent in twenty-five per cent. of his cases.

2. Pain varies considerably; it may consist of backache, epigastric distress, sense of fullness in one side or the other; or it may be crampy, intermittent, sharp and lancinating. The severity of the pain

usually increases with the period of gestation.

Pain is due to the distension of the tube, its rupture, or the invasion and irritation of the peritoneum.

3. Hemorrhage from the uterus. As a rule hemorrhage does not occur until the sixth week of gestation; usually scanty, never profuse. The value of the chocolate color characteristic of the blood as a diagnostic sign, has been questioned by a number of authors. In some cases where the patient comes to operation before bleeding occurred, the decidua may be expelled subsequently.

4. Uterine enlargement; the uterus enlarges but never to the size as it would in a corresponding period of intrauterine gestation. The consistency of the uterus particularly in early extrauterine pregnancy, is that of a non-pregnant uterus. The absence of the Ladinski sign of pregnancy, which consists of an elastic area in the anterior wall of the uterus at the junction of the cervix and body often helps to rule out an intrauterine pregnancy, particularly so between the sixth and tenth week of gestation.

5. The rapid enlargement of the tube, in the shape of a fusiform, elastic, tender, sensitive, movable tumor, is a most important sign as the following case will illustrate. A. M., married, age 28, consulted me with the history that she went over her period five days; fearing pregnancy, she took an emenagogue and is bleeding now for the past nine days; passing pieces as she termed it. Physical examination showed a somewhat enlarged bleeding uterus, in normal position and somewhat thickened right tube. A curettage was performed, some debris removed from the uterus, patient stopped bleeding for three days; but when

she began to move about, she again began to bleed. Ergot, icebag, and douches had no effect. There was no temperature. Examination on the sixth day, showed that the tube enlarged considerably. A diagnosis of ectopic was made and the patient was admitted to the Mt. Sinai Hospital. The history and examination did not impress the attending surgeon with the diagnosis of ectopic, a posterior vaginal section for diagnostic purposes was performed revealing the correctness of the diagnosis. A laparotomy and salpingectomy followed.

6. Temperature; before rupture or abortion, there is no elevation of temperature, with the presence of blood in the peritoneal cavity, a slight temperature of 100 or 101 may be present; a greater temperature is usually the result of an infection of the blood clots. At the time of rupture or abortion, the temperature may be subnormal.

7. Pallor is very marked; at the time of rupture, it may be due to shock; later on it is proportionate to the severity of the hemorrhage.

8. Syncope is a very frequent condition and occurs only with rupture or abortion. There are a number of cases in which rupture occurred with a loss of a considerable amount of blood without syncope.

9. Pulse; at the time of rupture the pulse is very rapid, thready, often imperceptible. When bleeding is not actively taking place, the pulse is but slightly accelerated.

**Diagnosis.**—The cases that are most often mistaken for ectopic are those of early pregnancy with signs of threatening or inevitable abortion, particularly with a retroverted uterus. Another condition one is called upon to consider in making a diagnosis of ectopic, particularly in cases where intrauterine manipulation has been prac-

ticed is that of pelvic infection—as pelvic abscess, etc. The greater amount of temperature, tenderness and rigidity of the lower abdomen, as well as fixity of the uterus, will help to exclude the latter condition.

Ectopic must be differentiated from appendicitis, pyosalpinx, hydrosalpinx, ovarian cyst, intraligamentous cyst, retroverted pregnant uterus, acute abdominal conditions such as rupture, gastric and duodenal ulcer, acute pancreatitis, cholelithiasis and renal colic. The presence of some of the symptoms of the above conditions, with the absence of physical signs in the pelvis, will help to rule them out. A condition which is almost impossible to diagnosticate from an ectopic is that of a small ovarian cyst on a sharply twisted pedicle particularly when accompanied by intraabdominal hemorrhage; however since both conditions are surgical, and both require immediate operation, the mistaking of one condition for the other, is not of such great moment to the patient.

Another condition which presents diagnostic difficulties, is that in which there is present an ovarian cyst on the same side of an ectopic pregnancy, and where there is no history of an amenorrhea. The following case of this type, upon which I operated recently, from the service of Dr. Sturndurf, at the Beth David Hospital, is of interest.

K. S., age 25 years, admitted to the Beth David Hospital, Nov. 2, 1915, with the following history: menstruation began at fifteen years of age, four weekly type, five day duration, moderate pain. Married 7½ months. Six months ago, considered herself pregnant and had a curettage performed. Her menstruation is still of same four weekly type, five day duration, last menstrual period occurred on October 16th, 1915, lasted three days but lost about her usual amount of blood, went clean one week, and is now having irregular bleeding, complains of pain in the right side. Pain at times sharp, but never severe enough to compel

the patient to take to her bed. Had no fainting spell, nor passed any decidua. On admission temperature 100, pulse 86, respiration 18. Physical examination: Uterus slightly enlarged, normal in consistency and position, Ladinski sign absent, mass in the right fornix with a distinct feel of an ovarian cyst. Operation Nov. 3rd, 1915. Uterus explored, found perfectly clean. Median laparotomy performed. Some free blood found in peritoneal cavity; no sign of fresh bleeding. Right tube is distended and ruptured near the outer end, imbedded in a clot about the size of a glass; in the centre of this clot the ovum was located, and immediately beneath this clot there was an ovarian cyst about the size of a small egg. A salpingo oophorectomy was performed in the usual way, the appendix and left adnexa being normal were not disturbed, the blood clots wiped away, abdominal wall closed in layers; patient left the hospital on the thirteenth day following the operation.

Curettage performed for diagnostic purposes, unless one is prepared for an immediate laparotomy, is a most dangerous procedure and in many instances has resulted in fatalities. A vaginal section for diagnosis is a much safer method; however one must be always prepared to proceed with a laparotomy, should the diagnosis of ectopic be proven.

**Treatment.**—The only treatment for ectopic is surgical. All are agreed that when an ectopic is diagnosed either before or after rupture with the patient in good condition, and no signs that hemorrhage is going on presently, an operation should be performed as soon as it can be done conveniently without much delay. Cases in which there existed a good deal of controversy regarding the time of operation, were those in which the patient was suffering from shock. But when one reads the reports of Dr. Sturndorf's 53 cases of prompt operation with no mortality, and the report of Dr. Ladinski's 200 cases of ectopic, 85 per cent. of which were ruptured, with a mortality of only 3 cases—one, in a case of hemophilia and the other two, where the

operation was delayed; and when one considers the ill effects of delayed operation, such as, greater loss of blood, increased shock and depression, operation fraught with greater difficulty as the result of more extensive pathology, crippled organs, and protracted invalidism, and furthermore when one sees the marvelous reaction of the patient as soon as a laparotomy is performed and the intra-abdominal tension is relieved and the hemorrhage checked, there remains very little to be said in favor of waiting. As to those who maintain that the picture of collapse with the rapid thready pulse, cold clammy skin, dyspnea and even cyanosis is due to shock, if one could make a definite differential diagnosis, and one could say that hemorrhage is not taking place presently, stimulating the patient and waiting for a reaction would be in place; but if one is to wait for a reaction which may never come, to stand idly by and let the patient die, would not be exactly good surgery. Medical treatment of ectopic has only its place either as an adjunct to surgery or in those cases where the performance of an operation is impossible.

The most important drug we have is morphine and that is to be used hypodermically. Hypodermoclysis before operation and intravenous infusion during and after operation are most important. Adrenalin, strychnine, camphor and caffein, elevating the foot of the bed, bandaging the lower extremities, artificial heat, rectal stimulating enemata of coffee, wine, brandy, etc., Murphy drip, are all very useful. Blood transfusion should be of great value.

The operation of choice, should be by the abdominal route, for the parts can be more readily exposed and the operation completed in the shortest possible time. The only objection to this being in infected cases, where

vaginal drainage is a safer procedure.

The tubes in cases of ruptured ectopics should always be removed. To leave a tube that was the seat of an ectopic, particularly so after sewing up a rent with its resulting scar, is only to invite another ectopic.

**PROGNOSIS.**—The results of operation for ectopic when not delayed, are usually very good. It is often surprising how soon after the operation, the patient's condition will improve and go on to a complete recovery.

### Conclusion.

1. The diagnosis of ectopic is often difficult.
2. To curette for a diagnosis, when not prepared for a laparotomy is to invite disaster.
3. Treatment for ectopic is only surgical.
4. The sooner the patient is operated upon, the greater the chances of her recovery.
5. When other means of diagnosis fail, a vaginal incision will always clear up the diagnosis.

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200 W. 113th St.

**Urethritis** in a woman is almost invariably gonorrhreal.—*Urol. and Cutan. Review*.

**To Make Salts More Palatable.**—Salts (*The Nurse*) may be disguised or made more palatable by adding one-half teaspoon of aromatic spirit of ammonia to the dose.

## OBSSESSIONS ASSOCIATED WITH INEBRIETY.

BY

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Every person who has studied inebriety has seen manias, phobias and morbid impulses common to the insane, follow the use of spirits. Some authors term these symptoms, insanities, psychoses, and mental derangements. The drink craze is the predominant symptom and the other conditions are supposed to be transient and temporary. There is much confusion here. Certain authors give greater prominence to the criminal instincts, and think the desire for spirits is a cultivated one, to conceal the criminal impulses. Undoubtedly in some cases the disturbed mental condition suggests spirits as a relief. Thus many an on-coming insanity is preceded by a craze for spirits, which may be both voluntary and involuntary.

It is noted in the police court circles, that a certain number of persons who serve a sentence for drunkenness, become criminal on regaining their liberty, and after a time, resume the use of spirits. While drinking continuously, the victim is an ethical, reputable citizen, entirely above suspicion but when he becomes sober, the criminal instinct asserts itself and he is another person.

A few very startling instances of this character, of which the following is an example, may be stated. A college bred man was employed in a law office as a clerk. He was a steady drinker but had the respect of his employers, was entrusted with responsibilities and duties which he fulfilled with scrupulous exactness.

He grew worse and eventually was sen-

tenced for sixty days to the workhouse hospital. He recovered and began a career of crime. While pretending to conduct bankrupt stores, he literally ran a clearing house for thieves and burglars, altering and disposing of their goods. In this he showed great shrewdness and cunning, and probably took part and assisted in the concealment of stolen property. He traveled from place to place, and was soon marked as an associate of high-grade criminals. He became prosperous and began to drink, then gave up this business and became manager of a large hotel and for a year or more gained the fullest confidence of the community. Then his continuous use of spirits ended in an attack of delirium tremens.

On recovery he disappeared and was traced to New York, where he was conducting the same criminal business as before. He finally went to state's prison and died.

Examples less prominent are those of persons, who after recovery from the drink craze develop the most intense selfishness and disregard of all the rights of common honesty; oftentimes they are petty thieves and always are unable to resist the slightest opportunity to take advantage.

Another class of drinking men exhibit the opposite traits while using spirits. When sober they are honest, reliable, generous and good citizens. When under the influence of spirits they are selfish, avaricious and criminal, with every opportunity. Sometimes the criminality assumes prominent proportions. At others it is confined to small matters.

The following is an example: A country boy brought up in good surroundings and with good moral training, went into the Army. After four years of service he returned, and was employed as a travel-

ing salesman. He drank at intervals, and during these periods he forged and passed checks and letters, calculated to make disturbances. When confronted with them, he declared he had no knowledge of how or why he did it. He became a wanderer, going from place to place, working well when sober, but when drinking posed in some way to take advantage of others. He was literally a first-class swindler, who while drinking, had a mania for taking advantage of someone and securing money or influence or something that would contribute to his own comfort. He showed great shrewdness and cunning in disguising himself and going from place to place. Finally he was sentenced to two years' imprisonment, charged with passing a forged check and receiving a balance on it. The moment he recovered he commenced a most elaborate system of creating sympathy and interest in his case. He was made clerk in the prison, and showed honesty and penitence that attracted attention, and brought him a good position afterwards.

A year or so later he commenced to drink, gave up his position, and started on the same career and was eventually arrested and sent to another prison, for the same offence.

It was evident that when sober, all criminal instincts were suppressed, or held in abeyance, but the moment he began to drink, they took precedence over all other instincts or training. His drinking was of a peculiar character, never reaching the stage of stupor or wild delirium, but stopping short in the stage of semi-narcotism, particularly at night. In the daytime he seemed to be normal in every way and was noted for his frank, open, honest manner and conduct, which attracted rather than repelled. Several times he was arrested by detectives,

who were misled by his apparent honesty and believed themselves mistaken in the man.

The question was, which predominated, the obsession to defraud and take advantage or the desire for drink? It appeared from a careful study that the drink impulse overshadowed everything else, and the criminal impulse followed as a sequence. When the first was broken up, he was an honest, normal man. When the second impulse came over him, he was a cunning high-grade criminal.

Opium takers are often criminals when deprived of the drug. The obsession to secure it at all hazards overcomes every consideration of ethics or honesty, and even ordinary business caution. Innumerable examples will occur to the reader.

A noted criminal came under my care once, who said, "If I could have a certain amount of opium daily, I could live an honest, Christian life." In this there was an obsession for relief from some central irritation which had to be gratified at all hazards. This man recovered. He went out on a farm. Hard work, in healthy surroundings, with good associates, enabled him to live several years, an abstainer and free from any suspicion of criminality.

Probably one of the most common obsessions is that of sexual gratification, by abnormal methods and ways. There is in every city perverts, so-called, whose obsession starts from the use of spirits, and sometimes never ends. Occasionally it subsides.

In my experience extending over a great many years, the correction of the drink impulse by building up the patient's mind and body, is often followed by a disappearance of the sexual impulse. The two are asso-

ciated. One leads up to the other and often one precedes the other.

To the mind of the layman a moral explanation is the most satisfactory. To the physician, it is the same study of cause and effect. One leading to the other.

A large number of drinking men in the early years begin the use of spirits with sexual excesses and this grows until it becomes a veritable mania which explodes and leads to the most astonishing developments of depravity and perversion of everything that is good. Unfortunately this is not confined to the ignorant and degenerates, but extends to intellectual and trained people.

Examples of this will occur to the reader, and need not be repeated. Many poor victims of this character realize the insanity of their conduct and appeal to medical men for help. The physician as a rule is confused and does not know what to do, hence temporizes and falls back on the moral theories. He seldom realizes that the physiological and pathological conditions of the patient call for help, much more imperatively than the most incurable organic disease. It does not occur to him that it is possible to give relief to these poor wrecked victims, and help them to restoration, yet this is done not unfrequently. It comprises a range of means and measures that are not mentioned in medical journals and not often discussed in any society, and yet, many physicians realize the possibilities of relief and restoration in this field.

There are hundreds of neglected men and women, occupying responsible positions, suffering not only from drink obsessions, but morbid impulses of a criminal character. Perhaps the morbid obsessions precede the drink impulse, and perhaps the drink obsessions are known in many cases, to be followed by the other.

Through neglect, inability to understand or to make a study of these cases, and give them the proper means and measures of relief, they drift into the ranks of criminals, paupers, dependents, become more and more incurable and are burdens and skeletons in all circles of society.

These persons have distinct symptoms, premonitory and actual, which are passed by as functional, and yet they are literal hints and signal flags of danger that should be apprehended and traced to their causes.

Men and women who show great extremes of character and conduct and personal opinions are abnormal and sufferers from physical and psychical degenerations. They should be the objects of medical treatment. Today we treat them as we did persons suffering from hysteria and nervous affections a century ago. We hold them responsible and punish them as sane and conscious of what they are doing. In the early stages we apply pressure of moral methods and means, unconscious of every other condition. With all our scientific studies we have passed by and left these poor victims weltering in their own blood by the roadside.

In epilepsy the aurae have been studied; the premonitory symptoms of an approaching paroxysm constitute the most startling hint of a physical and psychical storm that convulses the whole body and leaves the mind enfeebled.

Some physical symptoms have been found, the removal of which have been followed by recovery, but the great range of causes are still undiscovered. Inebriety is a striking parallel to this. The craze for spirits is a want, a demand, a convulsive call for help, and following this, other impulses come to the surface and demand gratification. A great range of new facts stretch

out from this point, that are yet to be determined.

As medical men in this country, we must take up these subjects, uninfluenced by tradition or prestige, and examine the facts and their meaning; then there will be a road for therapeutic measures and means that will revolutionize much of our present thought.

The hysterical assertions that the profession of medicine is overcrowded are only true in the narrow sense. The unexplored field of medical practice would employ vast numbers of starved physicians who would do great work and be most cheerfully remunerated for it.

Alcoholism, inebriety and drug taking are borderland neuroses that call for a new study, with as much urgency as that of any other disability or disease.

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## A CASE OF REEDUCATING SPEECH AFTER CLEFT PALATE OPERA- TION.

BY

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This most interesting case—psychologically, physiologically and sociologically—has recently come under my care and the results obtained have been so gratifying that it seems justifiable to print a short description of its course together with the methods used in its treatment.

A young Russian-Yiddish girl, now eighteen years of age, who came to this country when two years old, was born with a cleft palate. Through ignorance, poverty and environmental conditions, the cause of the child's not being able to talk until ten years of age was utterly unknown. At ten years of age she was sent to a public school

on the East Side of New York City, which she attended for two years; but because of her inability to speak, she made no progress whatever and therefore acquired no education.

The dire distress of the family made it necessary for the girl of twelve to earn her living. She was taken as nurse into a family where a physician discovered that an operation on her palate would be beneficial. At fourteen years of age she was operated upon and a most satisfactory healing of the palate was the outcome. There was, however, no attempt made at this time to teach her to talk. With an ear accustomed only to Russian, it was a most discouraging outlook for the girl to attempt to talk English. After four melancholy years at work, with little prospect, as she thought, of ever being able to talk, she at eighteen years of age, in the month of July, attempted to commit suicide from the Fifty-Ninth Street Bridge, New York City. Being rescued from the East River and taken to Bellevue Hospital, her kind employer, the head of a large novelty company in the business section of New York City looked after her welfare while at this institution, and upon her release from there wrote me concerning help for her speech difficulties.

For three weeks I saw the patient three times a week, an hour at a time and at the end of that time, not only was her whole personality transformed into a bright, cheerful, hopeful one, but the speech was as correct as a normal voice could utter, and articulation had become distinct, resonant and melodious.

The methods employed included breathing exercises, mouth and tongue gymnastics, stimulation of the muscles of the soft palate and uvula, conscious control of the muscular movements of the speech organs, i. e.: chest, throat, mouth, teeth, lips and nose; articulation exercises in which the difference between nasal and vocal sounds were dwelt upon; resonance in tones; tongue positions for the various consonants; vowel positions; melody and flexibility; relaxation and many other exercises involving proper enunciation. It was my intention while instructing this patient in the physiological processes of developing proper speech, to build up a new character by psychological and sociological methods. The

developing of self-confidence by distracting agents, such as using the singing voice to preface the speaking voice; by using whispering as an exercise; by using a metronome for slow deliberate speech and a megaphone for the quality—was accomplished. Right thinking, destroying self-consciousness, fear, timidity, helping in directing the future course in her life, providing ways and means for an education in English, and inciting an ambition to keep up the practice of proper vocalization—all helped to build up the new character, and the patient is now a joy to herself and all those who know of her original condition. The outcome of this instance well shows the results that can be obtained in many apparently hopeless cases by painstaking systematic methods carefully adjusted to the needs of each case.

## THE PROBLEM OF THE FEEBLE-MINDED.

As an editorial writer in the *Virginia Med. Semi-Monthly* (Feb. 11, 1916) well says: "Feeble-mindedness is one of the vital sociological and scientific problems of the day. Its prevalence and its relation to crime, poverty, immorality, prostitution, illegitimacy, venereal disease, inebriety; its association with insanity and epilepsy; its causes; the most effective methods of its prevention, and the most feasible plan for the care of its victims, are matters to which some of the greatest minds are giving serious thought. In England and other European countries, and in several of the States in this country, special commissions have made, or are making investigations; several institutions and organizations, and groups of scientists and individuals, here and there, are devoting earnest study to this great problem.

The Legislature of Virginia directed the State Board of Charities to investigate the question of feeble-mindedness in this State and report a comprehensive and practical scheme for the segregation and training, and the prevention of the procreation of mental defectives. The board had the aid and advice of mental experts and social workers in this State and elsewhere, and had its secretary and other representatives visit other



Letchworth Village, N. Y., one of the dormitories for the feeble-minded; cost the State the sum of \$3,000,000.

Character of the country of Letchworth Village, N. Y.

**The oldest inmate of the institution for the feeble-minded at Letchworth Village, N. Y.**

States in search of information and to observe the methods that were in successful operation. The board and its secretary have performed well the public duty assigned them, and it is hoped that their suggestions will be put into effect."

From the surveys made in Virginia and several other States, it appears that at least sixty per cent. of the inmates of almshouses, and those indigent persons receiving public aid, and the inmates of houses of prostitution, are mentally subnormal. Wherever systematic examinations have been made, about two per cent. of the children attending public schools have been found to be handicapped by mental inferiority. Compulsory school attendance would, without doubt, bring to light many that are now kept in their homes because of their inability to keep up with their grades. In private homes throughout the land there are thousands of individuals whose minds have never developed beyond that of the mind of a normal child under ten years old, and consequently constituting a grievous care and burden. In the absence of adequate preventive measures—and practically none have been instituted in this State,—the number of feeble-minded, epileptic, and insane continues to grow. It is estimated that the average number of children born to a feeble-

minded mother is a fraction over eight, including still-births; while that of the normal mother is four.

"The relation of crime to mental deficiency is a subject of investigation in the courts, especially the juvenile courts of some of our large cities, notably Boston and Chicago. It has been demonstrated that criminality and mental inferiority are more often combined in an individual than are criminality and insanity. Examination by alienists and psychologists has brought out the fact that from thirty to fifty per cent. of the inmates of prisons and reformatories are either feeble-minded or insane.

As to causes: It is incontestable that bad heredity, a general tendency to transmit defect, is responsible for two-thirds or more of the mental defectives. In the parents, grandparents, great-grandparents or others in the family of the feeble-minded, are usually found feeble-mindedness, insanity, epilepsy, and sometimes confirmed criminality. The neuropathic ancestral taint in the germ plasm may be transmitted to posterity, skipping a generation or two. Drunkenness in parents, injuries at birth, poverty and neglect in early life, are etiological factors. It is probable that heredity, accentuated by environment, has its influence in crime somewhat like it

has in subnormal and abnormal mental conditions. There may also be anatomical and glandular defects, the nature of which we do not yet understand, which may enter as a cause.

Physical defect, or disability, are readily recognized in the infant or very young child, and in many instances corrective surgical

edness, and palliative measures are only feasible for the latter. Perhaps some day surgical skill will, in a measure at least, improve the mental and moral status of some of the defectives. In the present state of our knowledge, the mental defective starts life hopelessly handicapped, and, unless taken into competent hands, will be an increasing burden and menace. The State should, therefore, undertake the most effective and practical methods of prevention and care."

In connection with the foregoing the interesting sociologic experiment that New York has undertaken by arranging a colony or village for the feeble-minded is being watched by sociologic students all over the country and the results already obtained would seem to indicate that the State has gone a long way towards the solution of this great problem. About eight years ago while Governor Hughes was in the executive chair at Albany, the first steps were taken to provide for the segregation of the State's mental defectives. Somewhat more than 2,000 acres of land were purchased in the Ramapo Hills at Thiells three miles back of Haverstraw and overlooking the Hudson. Plans were drawn for an institution capable of accommodating 3,000 and to cost approximately \$3,000,000. The kind of politics which prevailed in the administration of the State through certain subsequent regimes so delayed progress of the work of building that it was only a matter of a few months ago that the first group of four dormitories was completed and made ready for occupancy. Immediately, approximately 180 children were removed from Randall's Island and various asylums and charitable homes in the different counties along the Hudson River, to the new institution. Dr. C. S. Little, who was made the superintendent of the colony, promptly developed a method of caring for the inmates which early indicated its practical utility. In addition to meeting the requirements of the situation it is further expected the plan adopted will make the operation of the institution, relatively speaking, inexpensive to the taxpayers and demonstrate how to make the policy of segregation an economic as well as sociologic success. He expects through a combination of work and amusement, chiefly out of doors, to make the institution in part self-sustaining, and the in-

The youngest inmate of the Institution for the feeble-minded at Letchworth Village, N. Y.

procedure can be successfully instituted either then or later in life. The highest order of intellect is not incompatible with physical defect. The future mental growth and moral status of the new-born is purely speculative. There has not yet been discovered a cure for idiocy or feeble-mind-

Letchworth Village--His sword an adze.

Feeble-minded boys working at Letchworth Village, N. Y.

Some of the girls in Letchworth Village in the sewing room of their dormitory.

The girls at Letchworth Village going to dinner.

mates, at the same time, so happy that they will think of no other place as home. The farm and household work will furnish the employment, and provision has been made for all kinds of sports, such as baseball, swimming, football, skating, dancing. There are sand boxes and chutes, swings and see-saws, for the small children. The boys have hikes and sugaring-off bees in season.

For housing the inmates the dormitory system has been adopted. Each dormitory, one-story in height, will accommodate 70 persons.

The building, modeled in style after Monticello, Thomas Jefferson's home, has three main rooms, two of which are used for sleeping, and one for social purposes in bad weather. In addition there are of course the necessary sanitary and storage arrangements. Being built of native field stone, and heated from without there is very little danger from fire. The buildings are so designed that they could be emptied within two or three minutes. Other buildings are now in course of construction. The new institution is greatly needed in order to take care of the feeble-minded who are crowding the institutions at Randall's Island, and those who are not in institutions, but ought not to be cared for at home, and cannot be cared for elsewhere because of the lack of accommodation. The eyes of thoughtful people are on this interesting experiment. If it accomplishes its purpose, it will mark one of the most important steps ever taken in practical sociology and lay the foundation for similar projects in the other states in the Union.

**A Safe Antiseptic Dressing.**—The following dressing says *Life & Health* has proved excellent in old wounds, infected wounds, boils, erysipelas, and other conditions. In fact, it is a good general disinfectant for wounds, and obviates the danger of bichloride. The formula is:

Sodium citrate .....	0.5
Sodium chloride .....	3.0

Distilled water .....	100.0
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This should be applied to the wound on sterilized gauze thoroughly saturated, and the gauze should be renewed at somewhat frequent intervals.



Conducted under the Editorial Direction of  
• Dr. John W. Wainwright.

**Xylol in Dermatology.**—John E. Lane, (*New York Medical Journal*, October 16, 1915), declares that xylol was first used in 1872 as a specific for smallpox by Zuelzer. It was soon proven useless. Sabouraud next recommended it in pediculosis, seborrhea and allied diseases. Lane's experiences are that xylol instantly kills the parasite and destroys the ova of all varieties of pediculi. It may be undiluted in uncomplicated cases of pediculosis capitata. When so used its action is rapid and efficient. In other conditions when found desirable it may be diluted—alcohol, ether, each 25 parts; xylol 50 parts. This mixture may be applied on cotton, gauze or sponge, rubbing vigorously.

When pediculosis is complicated by excoriations or by crusts of impetigo he recommends to first apply to the head for a day or two a thick layer of petrolatum in order to soften the crusts. The petrolatum is then wiped off, the softened crusts dislodged with a comb and the head thoroughly washed. When the scalp is fairly clean an ointment as follows is applied to hair and scalp,—xylol 4 parts, petrolatum 30 parts. The excess ointment is removed the following day, and the head washed.

In pediculosis pubis, the xylol even when diluted causes severe burning, especially when applied to the scrotum. It can, however be sponged on the abdomen, chest, and axillae.

In seborrhea of the face, comedones and acne, xylol has a distinct value. Its most striking effect is seen in cases of seborrhea complicated by large numbers of black-headed comedones. Its solvent action assures prompt softening of the mass in each gland outlet and its subsequent removal.

Xylol will be found useful also in seborrhea of the scalp; in stubborn lepto-thrix; in alopecia areata and other conditions when a mild counterirritant is indicated. It is colorless, with a slight aromatic odor, insoluble

in water but miscible with ether, alcohol and acetone. It is quite inflammable, a solvent for fats and a powerful parasiticide.

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**Vaccine Treatment in Whooping Cough.**—Gerstenberger (*American Journal Diseases of Children*, October, 1915), reports on the results of the vaccine treatment of whooping cough with a vaccine of the etiologic organism. The results were generally successful; superior to those obtained from drugs. He emphasizes the importance of early diagnosis and the value of prophylactic inoculation. The action of the vaccine is most marked during the catarrhal period of the disease. Spasmodic cough was relieved and general suffering lessened.

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**Rest in the Treatment of Heart Disease in the Young.**—Barton, (*London Lancet*, September 11, 1915), gives his experience in the treatment of heart disease in boys between the ages of 10 and 14 years with prolonged rest. When the heart lesion had been brought on by chorea, the cases do not do so well as do those whose valvular trouble is directly traceable to acute rheumatism. He declares this difference to be due to failure to keep the patient quiet. The basis upon which his treatment depends is prolonged rest, the length to which he carries this depending entirely upon the condition of the patient. When the patient begins to get up he is started to making wool mats, rugs, etc., which gives an interest and keeps him employed. Good food and country air are the other factors in the good results which he describes.

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**Duration of Immunity from Smallpox Vaccination.**—Dr. Wm. H. Park reports in the *Weekly Bulletin of the New York Health Department* the results of his studies concerning the duration of smallpox immunity conferred by successful vaccination. He employed two means of arriving at a conclusion: one through observation of those having had a successful vaccination who were later exposed to smallpox; second, the duration of immunity to vaccination with

vaccine virus. Statistics compiled by the United States Public Health Service for a period of three years give the following: Of 18,953 cases of smallpox, 798 had been vaccinated within seven years preceding attack, 1,632 were vaccinated more than seven years preceding attack and 16,523 were never successfully vaccinated. He calculates that 99.9 per cent. of those never vaccinated will take providing the vaccine is of high potency. As to the duration of immunity judged by revaccination, Lescohier finds that after one year 28 per cent. become susceptible; after five years 50 per cent. and 85 per cent. after ten years. Persons are occasionally met who can be successfully revaccinated at the end of six months. Dr. Park concludes that it is wise for all those exposed to smallpox to be vaccinated if a successful vaccination has not been obtained within nine months and that all should be vaccinated every five years if smallpox is prevalent. Even when the disease is absent all should be vaccinated in infancy and again in childhood in order to continue immune.

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**Emetine in Mucous Colitis.**—Robinson, (*The Practitioner*, October, 1915), reports on the use of emetine in mucous colitis, phthisis and intestinal hemorrhage. He found it of distinct value in the hemorrhage of pulmonary tuberculosis. His routine practice is to give emetine hydrochloride in doses of  $\frac{2}{3}$  grain daily and to continue the dose for five days after blood had ceased to appear in the sputum. Even larger doses may be given if deemed advisable. In the hemorrhage from gastric ulcer he also reports gratifying results; it, he believes, causes blood and mucus in the severe cases of mucous colitis to decrease. Emetine, Robinson believes, should always be given hypodermically rather than by mouth. He finds in most cases a certain amount of tenderness at the site of puncture.

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**Stock Typhoid Vaccines.**—Wiltshire and MacGillycuddy (*London Lancet*, September 25, 1915), report their experience with stock therapeutic typhoid vaccine in fifty cases of typhoid fever, in which there was a mortality of 14 per cent. They believe

stock typhoid vaccine a valuable therapeutic agent and commend its use even when the diagnosis is in doubt. It is quite harmless to patients who may subsequently be shown not to be suffering from typhoid fever. They recommend an initial dose of 250,000,000 with an interval of three days between doses. When secondary infections of the lung intervene, care must be taken to regulate the dose and if possible combine with the stock vaccine another vaccine suitable for the secondary infection.

**Antityphoid Vaccination.** — Sawyer, (*Journal American Medical Association*, October 23, 1915) states that he finds in California that antityphoid vaccination meets the severe test in civil practice because it is then most used when exposure is greatest, and because but a small proportion of the people are vaccinated. He found that the failures to protect were five per thousand vaccinations reported, while deaths from typhoid were 0.49 per thousand, out of a total number of vaccinations reported of 8,124. The percentage of failures, he thinks, indicates a slight advantage for the Gay Claypole sensitized vaccine over unsensitized vaccines, but this is not conclusively proven as the different statistics were not comparable. He sees only a very slight difference between sensitized and unsensitized vaccines as regards the severity of the reaction following the inoculation.

stages of the disease when the patient is a sufferer from hypertension before he is stricken, and this pressure is increased by the fever of the acute illness."

**Strychnin in Shock.** — Hare in the article above referred to, "Nitroglycerin in Failing Circulation," also has this to say concerning strychnin: "It is interesting to recall that some years ago it was the custom of surgeons to give large doses of strychnin in shock and that recently this employment of the remedy has been entirely out of fashion on the ground that it increases shock. The question that I would like to ask is whether this condemning of strychnin is not worse than its abuse heretofore, and does not depend on the erroneous employment of the drug. Given prior to an operation I believe its effect is harmful, since by acting as a nervous irritant it renders the nervous system non-susceptible to shock, but after operation I still think it does good in many instances by rousing the shocked nervous system to increased endeavor. The claim that it is useless because the vasomotor center is paralyzed in shock is in the great majority of instances erroneous. The vasomotor center is not paralyzed in the sense that it is organically destroyed. Its functions in many instances are impaired but not entirely wiped out, and the use of strychnin by stimulating reflex activity, as well as that of the vasomotor and respiratory centers may be advantageous."

**Nitroglycerin as a Help in Failing Circulation.** — H. A. Hare in *The Therapeutic Gazette*, December, 1915, in part of an address read before a joint meeting of the Essex District Medical Societies in Danvers, Mass., September 8, 1915, on "Certain Facts of Interest About the Cardiovascular System," declares concerning nitroglycerin as follows: "Let me reiterate what I have often insisted upon on other occasions, namely, a protest against the use of nitroglycerin with or without other drugs for the purpose of helping a failing circulation. How this well nigh universal plan ever came to be practiced I do not know. There is no use for nitroglycerin in pneumonia except possibly in the early

**Horse Serum Treatment of Wounds.** — Liguières, (*Bulletin de l'Académie de Médecine*, Paris, November 9, 1915) has been investigating the action of horse serum in the treatment of wounds for some ten years. His experiments were first begun on horses and he was amazed at the rapid healing of the wounds. Liguières asserts that the serum drawn twenty-four hours after the first blood letting had always a greater curative value than that from the first bleeding. He regards this as due probably to a regenerating process taking place between the two bleedings. He thinks it wise to keep two horses, drawing the blood upon

alternate days. This may be continued for as many as twenty days. Compresses are immersed in the serum without heating and changed once or twice a day. If the serum is to be shipped or kept on hand for some time Liguières advises the addition of something less than 0.5 per cent. of phenol.

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**Phenol and Magnesium Sulphate in the Treatment of Wounds.**—Morison and Tulloch, (*British Journal of Surgery*, October, 1915), describe the technic adopted by them in treating wounds, septic and nonseptic with phenol and magnesium sulphate. They report this treatment as giving the best results clinically as well as experimentally.

Forty ounces of magnesium sulphate are dissolved in ten ounces of glycerine and thirty ounces of boiling water and sterilized in an autoclave. Its application is painless, easily done, while the dressings, even in badly septic cases need changing but twice in twenty-four hours. In recent injuries the wound is freely opened, bullet, portion of shell, clothing or other foreign substance removed and the whole wound surface swabbed with pure phenol. In fractures, the ends of the bones are treated in the same manner; loose but attached fragments are not removed. The wound is carefully packed with gauze wrung out of phenol solution 1 to 20, and antiseptic wool applied as an outer dressing, and this left in place for twenty-four hours. At the end of this time the wound is dressed, the gauze plug removed, wound syringed with the magnesium sulphate solution as above, loosely packed with sterile gauze wrung from the same solution and the whole then covered with a double layer of gauze or lint saturated in the same solution, over which a piece of thin cotton fabric, over this cotton wool, the whole being held in place by a loosely fitting bandage. When wounds are septic or suppuration is in evidence, the authors omit use of the phenol, beginning with the magnesium solution at once.

Dressings are changed every twelve hours, thus avoiding discomfort. In two or three days pus will have almost entirely disappeared, sloughs begun to separate and the wound surface have assumed a bright red color. Granulations never become

edematous or flabby, but firm and vascular. Epithelium proceeds vigorously from the edges of the wound. Constitutional symptoms seldom occur, probably because absorption is prevented by the density of the granulations; lymphatic and glandular infection or secondary abscesses are almost unknown. The effect upon compound fractures is in the majority of cases quickly manifest. Pus rapidly disappears, while necrosis in comminuted cases appears to be materially lessened.

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**Condensed Milk.**—W. H. Park, M. C. Schroeder and P. Bartholow, (*New York Medical Journal*, November 27, 1915,) give the results of their studies of condensed milk as follows: The value of sweetened condensed milk depends on the care and cleanliness used in its manufacture. There is no evidence that the bacteria or chemical constituents affect the health. When fed to infants, only the best grades of sweetened condensed milk should be employed. When carefully prepared from whole milk, sweetened condensed milk has special indications as an infant food. Many infants are unable to digest the fat of cow's milk, even though mixed with two or three volumes of water. In these cases the infant will vomit half digested curds of casein. A change to sweetened condensed milk will allay the vomiting. This milk usually has a constipating effect; it is not believed that it causes diarrhea. Clinical evidence shows that intestinal irritation caused by milk is due to the absence of fat, sugar and protein. Sugar is believed by these authors to have a food value superior to fat.

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**Roentgen Rays in the Treatment of Venereal Bubo.**—Kall, (*Münchner Medizinische Wochenschrift*, October 19, 1915,) reports encouragement in the treatment of tuberculous glandular disease with roentgenotherapy. He has also applied it for the last year and a half to treatment of venereal bubos. Results have been so satisfactory that Kall urges the Roentgen rays in their treatment, especially in the early stages or before inflammation is more than merely in evidence. This treatment will be

found more successful if begun before suppuration intervenes. Pain subsides and the patient can move about. Even after fluctuation has supervened, however, the leucocytes are destroyed and apparently absorbed. Fluctuation, pain and redness disappear; infiltration gradually retrogresses, leaving a pigmented surface. Indolent syphilitic bubos respond promptly to Roentgen ray. Developed abscesses must be evacuated by incision, after which secretion ceases and healing is hastened.

**Mercury Salicylate in Syphilis.**—Nelson and Anderson (*Journal American Medical Association*, November 27, 1915,) conclude an article on this subject by stating that they hesitate to declare the unaided mercury salicylate treatment of syphilis to be without value, but regard its value so slight as to make it unworthy of the time given to its administration.

**Fresh Air in Respiratory Diseases in Infancy and Childhood.**—John L. Morse, (*Journal American Medical Association*, January 8, 1916,) defines fresh air as cool, dry and in motion. This is the air in which we feel best, whether sick or well, and, if free from dust, the most suitable for patients with respiratory diseases. The air should not be cold when the mucosa of the upper respiratory tract is acutely inflamed, since it acts as an irritant under these conditions and increases the symptoms of heat and tightness in the chest. When the acute stage has passed, cold air will relieve the congestion and diminish the discomfort. The application of cold air to the body surface is also a vasoconstrictor stimulant, but it does not seem to be beneficial in pneumonia through this effect. Cold air also predisposes to involvement of the ears. When suffering from acute nasopharyngitis, children should be kept in the house in cold weather, in a well ventilated room with the temperature at about 60 degrees F. if in bed, or at 65 degrees or 68 degrees F., if up. Cold air does harm and should be avoided in acute laryngitis and acute bronchitis. In broncho-pneumonia the acute stage of bron-

chitis has usually passed and cold air may be beneficial, as it is in lobar pneumonia, but it should be remembered that injury may be produced by undue chilling, which should, therefore, be avoided.

**Emetine in a Case of Purpura Hemorrhagica Simplex.**—James C. Cole and Percy L. Querens, (*New Orleans Medical and Surgical Journal*, January, 1916,) report a case of the above condition successfully treated by intravenous injection of emetine hydrochlorid as follows: Local applications of gums as well as the glycerite of tannin was tried and later a 1-1000 solution of adrenalin chlorid; only from the latter was any improvement. There was free and continued bleeding from the gingival margins of the superior incisor and bicuspid teeth. The ecchymotic area extended almost to the frenum. The gums on both margins showed advanced pyorrheal involvement.

Calcium lactate in powder form was used after the above mentioned remedies failed, fifteen grains every four hours; this also proved valueless. Emetine hydrochlorid was then given intramuscularly for several doses and in each instance was followed by a hematoma the size of a small peach. Intravenous injections of emetine hydrochlorid were then resorted to, half a grain being given undiluted from the ampoule direct into the median basilic vein and this was repeated in six hours with improvement on the day following. Emetine was repeated twice daily alternating from right to left arm. The hemorrhagic areas began to undergo the various changes in color as is noted in blood degeneration while no new spots appeared; the patient's general condition improved. Emetine was continued until ten doses had been given when it was discontinued altogether because of complete disappearance of all symptoms. At the end of ten days the patient left the hospital without any signs of his condition when he entered, and with the pyorrhea much improved; temperature 98.4° F., pulse 86.

It would seem that in this case at least the intravenous route was the one of choice.

Conducted under the Editorial Direction of Dr. Henry R. Harrower.

**The Four Fundamental Principles of Organotherapy.**—Certain principles underlie the various measures that are grouped under the head of "organotherapy." These may be conveniently classed into four distinct forms: 1. Substitutive; 2. Homostimulative; 3. Empirical and 4. Specific.

These may be briefly considered here so that the fundamental basis of the use of various animal extracts may be more clear; and, therefore, that the reader may be the more willing to extend his clinical experiences in this increasingly helpful branch of medicine:

1. *Substitutive Organotherapy.*—Extracts of the glands of internal secretion may be administered to supply a deficient physiological secretion of organs that correspond to those from which the extracts are made. The disorder under treatment may be due to absence, atrophy or functional inactivity of these organs, i. e., the production of their normal active principles has been reduced or stopped. This is the generally accepted phase of organotherapy, and a typical illustration of this category is the use of thyroid gland to replace, in a degree, the secretion which is missing in myxedema, cretinism, etc.

2. *Homostimulative Organotherapy.*—The active principles of the various internal secretory organs have a definite stimulative and restorative action upon the glands which correspond to those from which the extracts are made.

It has been remarked by several French writers that organotherapeutic preparations exert a regulative action upon the organs to which they correspond, not only favoring the reestablishment of their physiologic activity but also favoring the restoration of their normal anatomic structure. Hallion of Paris is prominent among these and his

"law," already quoted in this department (AMERICAN MEDICINE, Apr., 1915, p. 253), enunciates this principle in the following words: "Extracts of an organ exert on the same organ an exciting influence which lasts for a longer or shorter time. When the organ is insufficient, it is conceivable that this influence augments its action, and, when it is injured, that it favors its restoration."

This is the basis of a large share of the clinical value of organotherapy; and is represented quite typically by the use of bile in hepatobiliary insufficiency, or corpus luteum in functional ovarian disorders.

3. *Empirical Organotherapy.*—Certain animal extracts undoubtedly bring about widely differing clinical manifestations, and as a result of accidental experiences which have been passed on for the benefit of others, and frequently duplicated by them, have come to be quite generally used without what might be called a definite scientific basis. Common examples of this form of organotherapy are the pituitary treatment of functional ovarian disorders, or the parathyroid treatment of paralysis agitans. (It is understood that there usually may be an explanation of the "how" of the action of such treatment, but it still remains more nearly empirical than scientific).

4. *Specific Organotherapy.*—In certain circumstances extracts of certain organs excite a very definite physiological response, not by virtue of their homostimulative influence, but by bringing about a certain activity, or, perhaps, by counteracting some morbid symptoms not due to any change in the internal secretory action of the corresponding gland of the patient. The most decided and remarkable type of this class of organotherapeutic remedies is the extract of the posterior lobe of the pituitary body

and its action upon unstriped muscle, especially upon the uterine muscle during labor.

**Pituitary in Asthma.**—Two or three years ago a proprietary remedy called "Asthmolysin" was introduced in Germany for the treatment of asthma. The formula is not available but the remedy is admitted to be of animal origin. The surprising character of some of the results obtained from its use stimulated a number of German scientists to seek the rationale. Riese (*Berl. klin. Wochenschr.*, July 19, 1915) believes that this remedy contains two distinct hypophysis preparations associated with epinephrin. This latter seemed to be the reason for certain collateral nervous effects, such as nervous excitement, pallor and tremor, which seem to be most pronounced following the first injection. Riese, therefore, prepared a total pituitary extract for injection and worked out a way of administering it to best effect, and reports that he has used it successfully in chronic asthma. He goes deeply into a consideration of the manner of its action and evidently believes that asthma results from loss of tone in the unstriated muscles of the bronchioles.

We know that the action of pituitary extract is more definite upon unstriated muscle *when it has lost its tone*, hence its prospective value is likely to be greater in such cases. Attention is called to the fact that atropine and the nitrates relieve asthma in quite a different manner, for they paralyze the antagonists of the sympathetic, hence there are obvious advantages of a treatment which exerts a positive rather than a negative action, for the asthmatic needs all the synergists that he can command. Quoting from Riese's conclusions: "In all probability the injections of hypophysis extract in asthma in some way make good the disturbance of hormone balance which originally made possible the disease. Persistent, systematic injections of total pituitary are able to cure asthma if they can restore to the musculature its lost tonicity."

It is quite possible that a prolonged course of injections of a preparation of this character would be both a hardship and an inconvenience to many patients and in such cases good results might be expected to fol-

low the use of total pituitary substance in doses of  $\frac{1}{2}$  to 2 grains three or four times a day, for some weeks. This dose is arbitrary and benefit may be more marked from larger doses, say up to 5 grains or even more four times a day.

It will be evident, of course, that the immediate and temporary results which follow injections of adrenalin or pituitary solutions, cannot be expected; and in extreme cases the rapid, palliative treatment may be instituted while the more gradual reestablishment of tone in the muscles of the bronchiole walls is being brought about.

Another point must not be overlooked. If there is a distinct infectious element in the production of the asthma, it must be attended to, as no lasting benefit can be expected from any treatment unless it is directed, like vaccine therapy, at the micro-organisms that have become an important factor in the disease.

**Bile in Tympanites, etc.**—Among several procedures recommended for the treatment of abdominal distension due to atony of the bowel (following abdominal operations and from other causes), the rectal injection of a solution of bile is well spoken of. Macdonald (*Canada Lancet*, July, 1914) suggests that a high enema be given, consisting of a pint of luke-warm water to which may be added two drams of purified ox gall and the same amount of glycerine. To this may be added, if desired, up to half an ounce of turpentine. The tube should be passed 12 or 14 inches into the rectum and the fluid very gradually injected and held as long as possible.

**Secretin in Digestive Disorders.**—W. E. Fitch (*N. Y. Med. Jour.*, July 24, 1915, p. 217) in a discussion on "Secretin and its Therapeutic Possibilities" said that "notwithstanding the contention of some of the English authorities to the contrary, his personal experience had completely convinced him that secretin was a potent remedy when administered by the mouth. For about a year he had suffered from symptoms indicating intestinal stasis, and these had been completely relieved by its use in this way.

When he stopped taking it he found that the symptoms returned, especially the signs of putrid gases and putrid stools, but, after taking for several days a dram of secretin solution three times a day after meals, these entirely disappeared. From his own experience, therefore, as well as from his observation of its effects on others, he was an enthusiast for secretin."

In the same discussion the writer suggested that an important field for the use of secretin preparations was in the treatment of all the digestive disturbances of children, especially the summer diarrhea and marasmus. A paper by him regarding this had been published in *Pediatrics* (1913, vol. xxv, p. 430). The principal advantage from its administration lay in the regulation of digestion that it so often brings about and the reestablishment of the normal production of the digestive juices—the most effective gastrointestinal antiseptics which could possibly be imagined. Another field for the use of secretin which had not been mentioned in these reports, was its value as a means of favoring nutrition in carcinoma. He called especial attention to the fact that it had no influence on the disease itself, but, since achlorhydria was the rule in carcinoma, secretin liberation would be reduced to a minimum because of the lack of hydrochloric acid stimulus to the duodenum, and the exhibition of secretin would therefore be a natural stimulus to the digestive cycle, and thus might prove of material service.

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**The Dosage of Posterior Pituitary Solutions.**—The size of the dose of posterior pituitary extracts administered in obstetrical practice has depended in a measure upon the manufacturers of the various brands of this substance. In general practice, at least, the dosage has been governed largely by the contents of the "standard" ampules.

At first, one cubic centimeter (of a solution representing 20 milligrams of fresh posterior lobe per cc.) was generally given; but more recently half this amount was found to be efficacious in many cases, and where this reduced amount did not seem to be as rapidly and thoroughly active as might be desired, it was repeated after an hour or even longer.

In a consideration of "The Use and Abuse of Pituitrin in Obstetrics" Norris of Philadelphia (*Amer. Jour. Obs. & Dis. Women*, May, 1915) offers the following suggestions regarding dosage:

1. Before dilatation of the cervix never give more than 0.5 cc. to primiparae.
2. After full dilatation the dose occasionally may be 1 cc.
3. To multiparae with yielding or fully dilated cervices, the dose was always 1 cc.

The dose may be repeated if desirable, and Norris states that the maximum amount used in any case under his care was 3.5 cc., in four doses. He found that the first dose is very often the most effective and that the value of this remedy is greater in multiparae, in whom delivery occurred within an average of 68 minutes after injection, while in primiparae delivery occurred 3 hours and 18 minutes after the last dose.

It is well to state that not all primiparae are so slow in responding to pituitary as indicated above, provided the injection is made when the os is dilated. It is *dangerous* to give this drug in primiparae when the os is not dilated.

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#### **Adrenal Treatment of Nephritis.—**

The leading article in the issue of *Gazzetta degli Ospedali e delle Cliniche*, for September 1, 1915, is an exhaustive consideration of the possibilities of adrenal "ootherapy" in the various forms of nephritis. Silvestri, who is an ardent student of all phases of organotherapy, remarks that considerable work has been done in Italy in the organo-therapeutic treatment of nephritis.

The results of different investigators are analyzed and several personal cases are reported. Experimental work on animals indicates that the use of adrenal preparations is of value in renal irritation, artificial or pathological; and in four clinical cases, Silvestri found that "adrenalin is a most valuable aid in acute conditions of nephritis, but that it is of little value in chronic conditions."

He refers to the report of Antonio who treated thirty cases of scarlatinal nephritis in children, with small doses of adrenalin, with good results.

Fede, also, speaks well of this treatment in nephritis of any kind at any age; he finds,

however, that the beneficial effects are more apparent in children since in them the elasticity of the renal glomeruli and tubules is greater, while the adrenal glands are proportionally larger in children than in adults. The remedy was given by mouth; and it is suggested that either  $\frac{1}{2}$  to 1 grain of total adrenal substance be given per day, in divided doses or 1 or 2 minimis of the 1:1000 solution of adrenalin chloride be dropped on the tongue every three or four hours, the total *per diem* amount being regulated by the response of the individual patient. For adults the dose may be larger.

**The Diagnosis of Slight Hypothyroidism.**—Lewellys F. Baker, of Baltimore, in his monograph "Some of the Commoner Types of Diseases of the Endocrine Glands," gives some important suggestions regarding the diagnosis of minor hypothyroidism, and calls attention to the fact that this condition is very often entirely overlooked.

In examining children for this condition, three principal points should be kept in mind: (1) retarded growth; (2) habitual constipation and (3) dullness in the schoolroom.

In adults there are a number of suggestive diagnostic indications: (1) persistent constipation; (2) endogenous obesity; (3) a dry, harsh skin; (4) subjective feelings of cold and (5) recurring drowsiness in the daytime.

Barker advises the therapeutic test in all cases where there is any doubt of the presence of a minor thyroid insufficiency. This is best carried out by giving increasing doses of desiccated thyroid gland, commencing with  $\frac{1}{2}$  grain, three times a day, and increasing the dose by  $\frac{1}{2}$  grain at intervals of two or three days, until 5 grains, three times a day, is being taken; and watching the symptoms very carefully throughout.

We believe that this dose limit is rather high. Fifteen grains *per diem* of thyroid, in minor hypothyroidism especially, is a large amount, and may cause unpleasant results.

**Organotherapeutic Paradoxes.**—The organotherapeutic extracts which are becoming generally used today, differ in many respects from the drugs, both chemical and

alkaloidal, to which we have become accustomed. These hormone-bearing substances offer some remarkable paradoxes. For instance, Dr. R. Alexander Bate, in the course of a paper read before the Louisville Society of Medicine, exemplified this in the following remarks about pituitary extract. He said: "Posterior pituitary substance has been observed to be quite paradoxical. It is known to raise blood pressure in asthenic conditions and has been observed to lower it in hypersthenic conditions. All have witnessed its diuretic action, yet it is equally serviceable in controlling the polyuria of diabetes insipidus. It stimulates growth in undeveloped youth and it retards old age—both mental and physical. It arrests menorrhagia and also overcomes amenorrhea. It empties the uterus in labor, but prevents postpartum pains."

**The Influence of Anterior Pituitary Substance on Egg Fertility.**—While still somewhat remote from therapeutics, the experimental results secured by Clark (*Jour. Biol. Chem.*, October, 1915) with the administration of anterior pituitary substance to hens, is of prospective interest. He gave this preparation to hens whose egg-production curve was on the decline, and it was effective as early as the fourth day after commencing the feeding. The hatchability of eggs from hens that had been given this substance was apparently also increased.

**Exophthalmic Goiter Treated With Adrenal Substance.**—Another angle to this same subject is brought to light in a paper by Crain (*Journal-Lancet*, Oct. 15, 1915) in which he reports the successful treatment of Graves's disease with desiccated adrenal substance. We know that the relation between the adrenals and pancreas is very definite and disturbances of their mutual balance result in very decided changes in the metabolism, and the gratifying results reported by Crain are of unusual interest when we recall the experience of Leviton just referred to (see "Pancreatin in Exophthalmic Goiter").

Under the administration of adrenal gland Crain's patient was progressively benefited.

The edema slowly disappeared, the size of the thyroid was reduced, the mental condition was improved and with the exception of the exophthalmos all the other symptoms—tachycardia, muscular tremor and thyroid tumor—disappeared with a promptness which occasioned much surprise. The exophthalmos was improved, but at the end of the course of treatment it was still slightly evident.

The usual dose of adrenal substance (total) is one grain three times a day. This may be cautiously increased to two or three grains to a dose as circumstances indicate.

### PRACTICAL POINTS.

**Apathetic Tendencies** and sluggish mind conditions are improved very much by thyroid extract.—*Dana.*

**Marked polyuria**, especially without glycosuria, is frequently of hypophyseal origin and may be benefited by suitable organotherapy.

**Neuroses and the Thyroid Gland.**—"The typical neurotic generally has, if not always, disturbances of the thyroid gland."—*J. A. M. A.*

**Gastric Hemorrhage.** — Twenty to thirty minims of 1:1,000 adrenalin solution in half an ounce of water every half hour. Repeat five or six times if necessary.

**In Cretinism or Myxedema** why not recognize that the associated ductless glands are also disturbed? Pluriglandular therapy is frequently more useful than thyroid alone.

**Thyroid in Menorrhagia.** — "When menorrhagia is due to thyroid inadequacy (and associated with other definite manifestations of thyroid disorder) the best hemostatic is undoubtedly thyroid extract."

**Directing the Activity of Pituitrin.**—It has been stated that when it is desired to produce special effects from the administration of pituitrin, if the cervix is packed it will be more likely to affect the uterus, while to pass a catheter will cause the influence to be more decidedly marked upon the bladder.

**The Infundibulum an External Secretory Gland.**—It has been remarked by Cushing, Coe and others, that the products of activity of the posterior lobe of the pituitary are secreted into the cerebrospinal fluid, whence their gradual diffusion into the blood stream may follow.

**Bichloride Anuria.**—Complete anuria following the ingestion of 15 grains of bichloride of mercury and lasting for 96 hours despite all orthodox treatment, responded to 3 mils (cc.) pituitrin during the last 24 hours. Complete recovery followed.—*Ther. Notes.*

**Impending Breast Abscess.**—When there is a tendency to "caked breast" and the milk is not flowing well, or even when there are evidences of a prospective mammary abscess, pituitary solution one-half mil (cc.) every two or three hours, by injection, is both rational and useful.

**Prolonged Pituitary Medication.**—Where it seems advisable to continue pituitary medication for some length of time, as in exophthalmic goiter, it may be more convenient to administer 1 or 1½ grains of total pituitary substance three or four times a day before meals.

**The irritability and tremor** in serious cases of exophthalmic goiter have been successfully overcome by a prolonged course of pituitary solution. The other associated manifestations, as diarrhea, insomnia, vomiting, tachycardia and dyspnea were also benefited. One cubic centimeter of the solution daily by intramuscular injection.

# THE ANNOTATOR

## INTERPRETING THE BOYLAN DRUG LAW.

We have been fortunate in having secured a copy of the opinion rendered by the Hon. John J. Freschi of the Court of Special Sessions of the City of New York in a recent case, and referred to editorially in this issue (page 87). Owing to the great importance of Judge Freschi's interpretation of certain moot points we take great pleasure in reproducing the opinion in its entirety as follows:

The defendant has been tried upon two informations, one charging that he, "being a duly licensed physician, unlawfully sold and delivered to Elizabeth Day a quantity of heroin without first making a physical examination of her for the treatment of injury, disease or deformity." This information was drawn under that portion of Section 246 of the Public Health Law, as amended by Chap. 327, Laws 1915, which states that "it shall be unlawful for any duly licensed physician to dispense, give or deliver any of the said drugs, except after a physical examination of any person for the treatment of disease, injury or deformity."

The second information charges that the defendant unlawfully failed to keep on record the name of said Elizabeth Day to whom he then dispensed, gave and delivered such drug in violation of Section 248 of the said Public Health Law. A violation of any of these sections is made a misdemeanor punishable as such.

Both cases were tried together under stipulation.

The evidence produced by the People upon the trial was that the defendant on July 20th, 1915, while the husband of said Elizabeth Day was in custody of the police, she went to the office of the defendant, who is a licensed physician; that he gave her a package containing heroin; that upon leaving the premises she was apprehended by a police officer and taken back into the defendant's office; that the defendant admitted that he had supplied the woman with this drug, delivered to her on behalf of her husband, without a physical examination of said Mrs. Day, claiming that the same was for her husband, who had been under defendant's treatment for the drug habit.

An examination made at the time by the police of the records of the defendant showed an entry of the quantity of the drug given Mrs. Day; but instead of her name being recorded, that of her husband was noted in the book.

The defendant, in his own behalf, testified that he was a duly licensed physician; that he had been treating the husband of the Day woman for about three months for a disease known as drug addiction; that he had made an examination of Mr. Day approximately three months prior to his (defendant's) arrest; that he had seen Edward Day on July 19th, 1915, the day previous to his arrest, and examined him then, gave him a drug, and that the medicine in question was delivered on July 20th, the following day to his wife, as a part of his treatment for her husband.

This case is the first prosecution, I believe, under this section of the Public Health Law, and may be treated as a test case. And, inasmuch as it may be treated and regarded as a precedent, it might be well to have an expression of opinion on the law governing under these facts. The record presents, it seems to me, these points: (1) Is a physician required to make a physical examination of the same patient to whom he delivers the drug on each occasion before such delivery? (2) Can such delivery be lawfully made to the agent or representative of the patient within a reasonable time after the examination; and, if so, (3) is an entry in the doctor's record of the patient's name instead of that of the agent, a compliance with the requirements of the law? Of course, the question of fact and the bona fides of the defendant in making the diagnosis and the delivery are always in question in a case of this character.

Does the delivery of the heroin in question, and making the record thereof in the manner above indicated constitute these acts of misdemeanor within the purview of the statute now under consideration?

The People contend that the intention of the Legislature was that the drugs, heroin included, enumerated in Section 245 of the Public Health Law should not be supplied to any person to whom the same should be supplied through any messenger, and only after a physical examination of the person to whom the same should be supplied as required by Section 246 thereof. And in this connection, the District Attorney argues that in cases where liquor dealers have attempted to defend themselves for delivering liquor to minors on the theory

that the child was its parents' messenger, the courts have held that this is no defense, as they also have, in the sale of tobacco to children where the defense offered was that the same was delivered to them as messengers for their parents or some adult person. (See Sec. 484, Penal Law). This statute is not applicable to the case at bar, nor are the cases decided thereunder. This latter statute was enacted as Chap. 41, Laws 1906, after the decision of the Court of Appeals in *People v. Zabor*, 183 N. Y. 242. The Court held in that case that a conviction under the section of the Penal Code, which made it a misdemeanor for a person to furnish tobacco in any form to any child actually or apparently under the age of sixteen years, was not warranted where the evidence discloses that the boy to whom the defendant sold a package of cigars was sent to the store and furnished with money by his mother for the purpose of procuring cigars for a person who boarded with her; that he told the defendant whom they were for, and that the defendant knew the fact, the boy having been sent on a similar errand many times before, since in the circumstances the cigars were sold, not to the boy but to the person for whom he was directed to procure them, the boy acting merely as his agent. The burden of proving the agency in all such cases, I think, is properly with the defendant. (*People v. McGuire*, 113 App. Div. 631). Section 484 (Penal Law), permitting children to attend certain resorts, makes the acts therein inhibited a misdemeanor, and then provides: "It should be no defense to a prosecution for a violation of sub-divisions three, four, five or six of this section, that in the transaction upon which the prosecution is based the child acted as the agent or representative of another, or that the defendant dealt with such child as the agent or representative of another."

The Public Health Law (*supra*) contains no provision whatsoever of this sort limiting the defense of agency or rendering it nugatory. Had the Legislature seen fit to do so, is it not reasonable to say that the law would have, in some way, indicated that it shall not be a defense to any prosecution for a delivery of heroin to the person or representative of the patient? The absence of any such provision is a significant and potent circumstance indicative that the Legislature did not seek to make it a crime for anyone to deliver heroin to a representative of his patient as was done by Dr. Hoyt. The intentment of the Legislature is the pivotal point of the case. It is perfectly clear that the Legislative intent is to prevent physicians from delivering any of said drugs to any person before a physical examination; but, in establishing this as a condition precedent, I cannot hold that physicians, in dealing with the problem of narcotic drug addiction and the treatment of it as a medical disease, which, as appears from the testimony in this case, is somewhat unsettled as a medical proposition, must make a physical examination of his patient each time that the drug is delivered.

I recognize that a great deal of crime is being committed in connection with the illicit

traffic in habit forming narcotic drugs, and that the drug addict is at the mercy of the illicit trafficker (whether professional or otherwise), who is willing to exploit the unfortunate victim. The law cannot deal too severely with the criminal who commercializes and exploits the physical necessity in such cases; and it is wise that we have stringent laws and a swift and a strict enforcement of them to deal with the individual who supplies the drug through channels of illicit drug commerce. But I doubt that the Legislature intended to require that a physical examination shall be made as many times a day as the drug is administered by a doctor, or as often as it shall be necessary to prescribe it, to properly treat a given case over a stated period. The expert proof, in this case, shows that a diagnosis can be made and suitable treatment given covering a considerable length of time with only one examination of the patient. The defendant made a physical examination of Mr. Day that enabled him to determine the amount of drug he required in his treatment from day to day, and thereafter and within a reasonable time, he delivered or caused to be delivered the medicine for such treatment. In this, he has met the requirements of the statute.

As to the legitimate manner of delivery of the drug, whether made personally to the patient, or to his messenger, we must look to the statute, as a whole, to enable a determination of this phase of the case. It must be remembered that the law permits the examining physician, issuing to the drug addict a prescription to procure the amount of such of these drugs as the treatment of his case demands, which may be purchased from a druggist. There can be no question that the person for whom the drugs are intended can send his messenger with the prescription to have the druggist fill it and dispense the medicine called for. If this is lawful, why, then, cannot the physician, who has the right to prescribe the medicine, give the drug himself to the same messenger for the patient? I find here a bona fide delivery of heroin to the wife of the Mr. Day, one of the defendant's patients, for his use while under defendant's professional care and treatment. If the court were to believe that delivery was to Mrs. Day for her own use, or the use of someone else other than that of her husband, the case of the People would be made out. The evil aimed at and sought to be cured and prevented, if possible, is the sale of the proscribed drug to persons who are not under some form of medical control and supervision; and the court should not extend the statute to cases unless they come clearly and plainly within the intentment and purpose of lawmakers. Many instances can be cited where a physician might examine a patient and later deliver through another the drug suitable to the treatment of the case. It is purely a question of credibility. I can, however, conceive of a defense like this being urged as a subterfuge to escape the consequences of an infraction of the law, but each case must stand on its own bottom.

It is not fair nor just to suppose that the object of the law is to embarrass the medical pro-

fession or to effect a procedure whereby persons are compelled to resort to those who commercialize the drug in an illicit traffic of it.

It is elementary that that interpretation must be given to the act which will best effectuate the intent of the Legislature, and that is to be reached by taking the words of the statute and giving to them their plain, natural and ordinary meaning and signification. Personal delivery of a drug under these circumstances is not a violation within the purview of the statute. This is clear from a reading of another section of the act in question which requires a record to be kept if delivery be made "in any other manner." See sec. 248, Public Health Law. So much as applies to this case reads: "All persons authorized by law to sell, administer, prescribe, dispense or dispose of any of the drugs enumerated in section two hundred and forty-five of this chapter, shall forthwith keep on record the name and address of each person to whom such drug is dispensed, given or in any manner delivered \* \* \* Any violation of this section is hereby declared to be a misdemeanor." The act taken as a whole points unmistakably, in my judgment, to the construction as reasonable, and as manifesting that the legislative intent was, that such drugs might properly be delivered by a physician, who has made the required examination, to his patient directly or through his agent, and that the recording of the name of the patient is a substantial compliance with this law, although I deem it advisable in such a case for a physician to record, as well, the name and address of the agent.

The defendant was acquitted.

**The Hasty Diagnosis of Tuberculosis.**—A hasty diagnosis of tuberculosis may prove just as dangerous as neglect to recognize active and progressive disease. It may just as well produce misery, break up families, lead to financial and moral disaster as negligence in cases which need careful treatment. Not only the individual affected pays dearly for our frequent haste in pronouncing a person tuberculous, but also the community at large. These nontuberculous patients, as well as those suffering from mild abortive varieties of the disease, take up places in the public institutions which rightly belong to those who suffer from active and progressive disease and who are shut out because the institutions are filled with individuals who suffer from diseases which are either spontaneously curable, or could get well while remaining at home. They may also be spared of the stigma which tuberculosis is at present considered, the idea of which, during the enthusiasm in battling

against the disease, we have engendered in most of the enlightened communities. In the average case of tuberculosis a prompt diagnosis is undoubtedly desirable, but this does not mean that undue haste is to be exercised. More harm can be done by haste than by reasonable delay.—M. Fishberg, *Medical Record*.

**The Differential Diagnosis of Gastric Ulcer.**—The pain of angina pectoris does not have the periodicity characteristic of ulcer. The pain is seated behind the cardiac region, and radiates into the left arm.

Cholelithiasis is the cause of sudden pain attacking a patient in full health. The painful paroxysms have no regularity and they are often associated with alimentary excesses or faults of diet.

Intestinal colic is associated with constipation or diarrhea. Its duration ordinarily is short. It is associated with intestinal trouble.

Pancreatic calculus, embolism of the mesenteric vessels and lead-colic should also be considered. It will suffice to suggest these here.

In cancer of the pylorus, gastric acidity descends to beneath normal. This sign hardly ever deceives. It is more important than the presence of lactic acid, since the latter can be formed only in cases of hypochlorhydria or achlorhydria.

The vomiting due to ulcer may be confounded with that of the gastric crisis of tabes and with nervous vomiting. Here also one should remember that pain from ulcer appears more or less early after eating, and that these attacks are in the epigastrum, violent, agonizing, and may radiate to the sacral region. This is a sign which rarely deceives.

**Influenza Epidemic in the United States.**—According to reports received by the United States Public Health Service, during the last few weeks influenza has become epidemic in practically all parts of the United States. It is present from the Atlantic seaboard to the Pacific coast and has spread even to central New Mexico. It is also pointed out by officers of the service that the disease is undoubtedly epidemic in many places from which no reports have been received.

**Diagnosis of Paternity.**—Drs. Mayoral and Jiminez, two French scientists, have published their researches regarding certain blood reactions (*Canadian Practitioner and Review*) which they say enable them to pronounce whether any given man is or is not the father of the fetus which the expectant mother is carrying. Briefly, the test is blood corpuscles from a man made into an emulsion with an isotonic saline solution when injected under the skin of the pregnant woman causes an erythematous and slightly painful reaction around the site of the injection within six hours. No reaction occurs if the woman has been impregnated by another man.

The matter is still in an experimental stage and it is too early to draw any positive conclusions, but certainly the results published are very interesting.



**The Method of Therapeutic Prophylaxis of Scarlet Fever** recommended by Milne, has recently (*Lancet*, Aug. 21, 1915) received the endorsement of no less an authority than Professor Chantemesse, whose work in France has attracted world wide notice. In a recent communication to the Paris Academy of Medicine, he recommends Milne's methods and reports good results in his extensive clinical work.

This method consists of two procedures: Thorough swabbing the throats of scarlet fever patients with a 10% carbolized oil at intervals of three hours day and night for 48 hours, and then twice a day for seven days. (For children the strength of the solution was reduced, in some cases as much as one-half). With this was combined daily friction of the whole body with eucalyptus oil.

These measures have a marked deterring influence upon the facility with which infection is transferred, and while their therapeutic value may be useful, the prophylactic value is most decided. The same procedure is now officially recommended in the medical service of the Italian navy and in a recent article (*Ann. d. Med. Navale*, Jan., 1916), Rho, the editor, believes that this empirical procedure may later be explained in a scientific way and hazards the suggestion that in scarlet fever and measles the infection may be carried by insects, and that the eucalyptus oil, by keeping them at a distance, prevents the spread of the disease.

Milne's method deserves wider application in this country.

**Amebic Liver Abscess Treated Surgically and with Emetin.**—Dr. Deaderick in *Medical World* (Feb., 1916) gives the following treatment: Abscess of the liver is often very hard to diagnose. Typical cases will be accompanied by septic temperature, increase in the size of the liver, pain in right hypochondrium and shoulder region, tenderness and leucocytosis. Exploratory puncture with a long needle will settle many doubts. The lumbar puncture needle is the best for this purpose.

The endamebas are found in about 50% of cases in the aspirated pus, but can be found in a much larger proportion in the scrapings from

the abscess walls. The treatment is essentially surgical. A method of treatment which should be given a thorough trial is the evacuation of the pus through a trocar and the administration of emetin hypodermically,  $\frac{1}{2}$  grain daily, for about six doses. Where there is good reason to believe that the abscess cavity is well walled off emetin should be injected into it directly in dilute solution.

**Subcutaneous Injections of Distilled Water** are claimed by a writer in the *Lancet* (Dec. 18, 1915, p. 1351) to exert a decided therapeutic influence. Stephens, who had previously advocated this rather novel form of treatment (*Brit. Med. Jour.* Apr. 5, 1915) reports the successful treatment of a case of multiple ulcers of six months duration, which had failed to respond to a number of the ordinary local and general procedures.

Three injections of distilled water were given into the loose tissue below the scapula, the second after one week and the third two weeks later, by which time all of the six ulcers were practically well.

It is suggested that this subcutaneous injection of distilled water—10 to 30 mils (c.c.)—so affects the surface tension of the corpuscles as to permit a more ready mobilization of the necessary antibodies, or, and this appeals to us more strongly, improves the leucocyte's powers of diapedesis, since much depends upon this especially in just such a condition as that which appears to have been treated successfully in this manner.

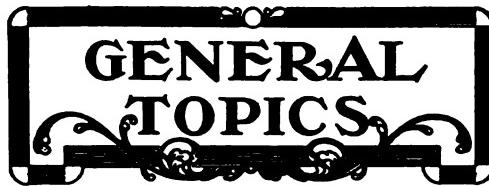
**Medical Treatment of Gastric Ulcer.**—Dr. Johnson, in the *St. Paul Medical Journal*, gives the following basis of treatment:

1. Consider every case of gastric ulcer as a severe case, for any mild one may become severe in an hour's time.

2. Entirely abandon the ambulatory treatment. Absolute rest is just as important in the case of a gastric ulcer as it is in the case of a fractured femur.

3. You must diagnose ulcer much more frequently than heretofore, and must make a more thorough and much longer search for complications and sequelae, insisting upon having cases under observation for ten days where there is any doubt whatever. The surgeon must be called much oftener and quicker than he has been heretofore. No pains must be spared in looking for indications for operative measures.

4. The writer would add to the indications for surgical intervention hypersecretion and constant findings of either free or occult blood in the stools after a month of the Leube rest cure. Other important indications are: severe continued pain, chronic invalidism, and uncontrollable vomiting.



**The Medical Needs of Modern Armies.**—Interesting side lights on the need for a sufficient supply of medical officers in war says the *Military Surgeon* (Jan., 1916), are shed by correspondence to the London *Lancet* of November 20, 1915. The secretaries of the Harveian Society called a meeting of that society to discuss the organization of the British medical profession for war service, and in their official announcement said: "This topic is assuming very great proportions, for the actual personnel of the Army Medical Service must already be approaching 10,000 in place of the peace establishment of 1,000." And on the same page another communication says: "The authorities at the War Office are very uneasy about the supply of doctors to the Army. At their request a War Emergency Committee in connection with the British Medical Association has been established, and a committee is working with all its power to see if they can find by the middle of January some 2,000 odd medical men which the War Office deem necessary."

It appears, then, that the British army will shortly include no less than 12,000 physicians with the colors, in order to satisfy present immediate needs in the medical service. This despite the fact that the main bulk of the fighting is in Flanders, where the conditions of trench warfare and short haul permit of great economies in medical personnel through the ability to eliminate many of the intermediate sanitary formations which are ordinarily required to bridge the gap between the firing line and the base.

Clearly the situation as to medical officers in which Great Britain finds itself has many morals for us. We must appreciate that in the United States, too, the day of little things is over and that no question of national preparedness is complete without the inclusion of the medical profession in civil life in terms of many thousands. Such immense numbers of troops will be necessary that any regular medical personnel which could be maintained in peace will scarcely suffice to leaven the mass in war. Efficient administrative machinery must be created and maintained to secure and instruct in the elements of their medico-military duties the vast mass of medical men whose services will be required. This additional work will chiefly fall upon the Medical Corps of the army, now both actually and relatively too small to do its routine work in time of peace. Efficiency demands that not only must the Medical Corps be given enough officers in the coming defense plans to do the peace work of the standing

army, but it must share proportionately in the large extra and unassigned list of officer instructors which all schemes for defense agree upon as being absolutely necessary for the education and training of the second line forces.

An army is a many-sided and very complex structure, every part of which has a definite relation, usefulness and proportion to the rest. This is a fact of which many of the civilians upon which we have to depend for service legislation are ignorant, and one which a certain few line officers who are better informed seem to choose to ignore. To attempt to pile up fighting men without sufficient medical personnel to maintain physical efficiency defeats any expectation of securing maximum fighting strength. The Medical Department wants only what is necessary. It must insist on having enough officers in peace time to make it feel a reasonable competence to perform satisfactorily the tasks which devolve upon it in peace. It will expect in time of war a personnel adequate to perform war duties. With anything less than this reasonable provision it will not be satisfied.

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**The Therapeutic Value of Orange Peel** has recently been brought into prominence by Rosenthal, a medical officer on active service with the French army. For nearly a year he has been using prepared orange peel as an agent for the regulation of the intestinal hygiene of the soldiers under his care.

The sedentary and cramped conditions surrounding trench life, despite the periods of change which vary with circumstances, undoubtedly favor constipation and stasis and while the more serious intestinal disorders, as typhoid fever, have been controlled by anti-typhoid inoculation and other measures, the simple, every-day disturbances are sufficiently frequent and important to occupy the attention of practically all army physicians, especially those whose work is essentially of a medical rather than a surgical nature.

Rosenthal has been using plain orange peel prepared in the following manner: Fresh orange peel is boiled for half an hour in plenty of water. The bitter infusion is usually thrown away, though it has been used to cleanse the teeth. The softened peel is then boiled for a further half hour in slightly sweetened water and later dried. It is then ready for use.

The peel of one orange is an average dose, and it mechanically excites the intestine in a manner very similar to other forms of cellulose or agar. It is evident that the evacuation is not purely mechanical, for there is an increased flow of bile which sometimes continues for several hours. Rosenthal believes that this is a rational procedure that might well be used more extensively and methodically, since orange peel is easily obtained, and seems to unite in itself both a cholagogue action with a mechanical stimulus to peristalsis.

**Turpentine vs. Tincture of Iodine.**—Among the numerous personal experiences being related by American volunteer physicians returned from service with one of the Red Cross or other ambulance corps, one often gleans a remark of prospective practical value here.

Spillman, of Cincinnati, (*Lancet-Clinic*, Jan. 15, 1916) has something to say regarding the value of local antisepsics in fresh wounds. While the efficacy of tincture of iodine in suppurating wounds is undoubtedly, its use before suppuration has set in is positively contraindicated as it forms a coagulated film of albumen about the wound and reduces the vitality of the tissues thus insuring a favorable culture medium for any germs that might otherwise be taken care of by natural leucocytosis. This writer then asks if some agent is needed for immediate application to fresh wounds, why not use turpentine? That it is valuable as a preventive of complications in wounds is evident, for its general use by painters and others undoubtedly explains the rarity of infection in their very frequent wounds. The penetrating power of turpentine is easily demonstrated, for one can recover from the urine a good proportion of that which has been applied to the skin.

It is doubtful if large surfaces should be bathed with turpentine, since its influence upon the kidneys just mentioned, might be detrimental especially where there is a tendency to renal disorder.

**Education in Food Inspection.**—Correct ideas of food inspection or selection cannot be too urgently advocated. The public are entitled to expert instruction upon so vital a matter of health as the inspection and selection of food, and to this end the New York Health Department's Bureau of Food and Drugs have organized a course of lectures, conferences, and demonstrations dealing with the various aspects of pure food work. The lectures will be presented by experts selected from the force of city inspectors. Articles of food will be dwelt upon in the various lectures and demonstrations made, all of which good work will tend to better health of the people as a whole.

**Note on the Application of Solvents to Social Nuisances.**—The sphere of chemotherapy has gradually been enlarged. Its application has been made in many fields of therapeutics. The suggestion of the usefulness of solvents in preventive medicine has largely been limited to the sphere of disinfectants and germicides.

The Health Almanac of the State of New York of January, 1916, presents an ingenious application of chemical solution to many of the social nuisances underlying physical disability. The commendable presentation by Cressy L. Wilbur, S. C., (Social Chemist) merits reproducing as follows.

"In the application of solvents to social pui-sances, it is well to follow a prescribed order

of procedure, progressing from the mildest to the most active agents. Reagents should be used at first cold (ordinary temperature); when the social nuisance or concretion is readily soluble it is unnecessary to wax warm over the matter. Heat (righteous individual and public indignation) may be an important factor; it promotes solution as a rule, but should be carefully graduated and its application watched. Otherwise it may cause 'bumping' and even breaking of the test tube in which the experiment is conducted.

#### ORDER OF REAGENTS.

1. Water,  $H_2O$  = Public Opinion. In small amounts (individual opinion, personal influence) this is useful for minute social concretions; but larger ones, especially those which are protected by the slime of private and public neglect, which may have accumulated for years, will require plenty of the reagent, often supplied with considerable force by a rapid rotary movement of the tube (public opinion, especially as organized for mass or collective action). It should be remembered that water (= Public opinion) is the only real or universal solvent, and must be present as the agent essential for true solution in the following reagents as well.

2. Hydrochloric Acid,  $HCl$  = Criticism, Comparison. If water fails, try a little dilute  $HCl$ , first cold, then warmed slightly, with increasing application of heat until the boiling point is reached. Look out for "bumps," which may throw the liquid out of the tube and spoil the experiment, besides wasting valuable material.

3. Nitric Acid,  $HNO_3$  = Publicity. If water and hydrochloric acid fail to dissolve, then a little nitric acid may be tried, increasing the strength from the very dilute solution (discussion, conference, group meetings, individual letter to local newspaper, talk, talk, talk!) to the hottest, strongest application of the reagent required (full newspaper publicity, with names, dates, photographs, and specifications of the men responsible for the undesirable conditions). N. B. Be careful when boiling strong nitric acid in thin, possibly fractured, glassware.

4. Aqua Regia vel Democrata = Enforcement of Law. This does the work when other means fail. It is a combination of (2) and (3), with plenty of water. The effective agent thus liberated for work is Chlorine,  $Cl$ , which not only dissolves the substance, if soluble at all, but also purifies the atmosphere and prevents the formation of other nuisances. It has been too little used.

Other agents, e. g., Alcohol (indifference; often causes concretions), Ether (local, state, or national 'pride,' which refuses to recognize anything undesirable in home conditions), and Chloroform (individual and public stupor, which tolerate even the most painful and disgraceful nuisances), need only be mentioned as being of little or no practical value."

This ingenious and clever parody will be heartily appreciated by those who have to deal with social nuisances. It is signed by Cressy L. Wilbur, S. C.

# American Medicine

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Epilepsy, and especially the so-called idiopathic form of this disease, has always been a puzzle to careful students. We have yet to learn what the cause is, although undoubtedly many of the important factors responsible for this condition are quite well understood.

In recent years increasing stress has been laid upon the influence of toxins produced in the alimentary tract, and careful dietetic regulation with a reduction to a minimum of the intake of easily putrefiable foods, especially meat, and thorough elimination by all routes, have often constituted the sole treatment; not infrequently the results are excellent. At least such treatment is decidedly more *curative* than the indiscriminate use of bromides which has characterized the attempts of so many charlatans and careless physicians. Now that the war has raised the price of the bromides to such a high level, some physicians are finding that elimination is better than routine sedation and the treatment of epilepsy is undergoing quite a revolution.

Those who are interested in this subject will find much of moment in several communications from the pen of C. A. L. Reed of Cincinnati who comes forward with a new and somewhat original theory which deserves careful attention not only because of the eminence of its author but because of the clinical rather than experimental

work that has brought him to this conclusion.

For some years Reed has been convinced that epilepsy is very intimately associated with intestinal stasis, and from the study of over 700 cases—enough at least on which to base some practical conclusions—he found that in practically 100% a mechanical type of stasis was present. The resultant intoxication was marked and since it was of an acid type, it is suggested that this acidosis is responsible for the production of areas of focal edema in the brain.

Treatment for such a syndrome is obvious and the combination of thorough elimination and lubrication with the judicious use of alkalies should help a great deal.

As he is a surgeon Reed has naturally found opportunities to operate more frequently than his medical colleagues, and while we may not agree with all the postulates set forth by Sir Arbuthnot Lane, it is of interest to note that in the course of his operative work, Reed constantly noticed an enlargement of the lymphatic glands of the abdomen and from many cases was able to isolate an organism which he has named the *epileptococcus*. This has been considered to be "the specific etiological factor of the so-called idiopathic form of epilepsy," and if this is more generally confirmed the detoxicative measures may be amplified advantageously by the use of a vaccine.

These theories need corroboration and whether they are eventually "accepted" or not, treatment based upon them is likely to be far more effectual, hence rational, than dosing the individual with powerful and dangerous sedatives, the use of which may be of doubtful indication.

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**Health Insurance.**—At a recent meeting the New York County Medical Society accepted a report of the Committee on Legislation condemning a bill to offer health insurance to the workers of New York State. The real reason behind the rejection of the bill was the fact that it did not contain specific provisions with reference to the fees to be paid to physicians.

The purpose of the proposed enactment was to provide health insurance for all workers earning less than \$100 a month. The benefits to be provided included medical, surgical, and nursing attendance, a cash benefit beginning on the fourth day of illness, equal to two-thirds of the wages and given for a maximum of 26 weeks in one year, and a funeral benefit of not more than \$50. The plan of payment for these dispensations provided for two-fifths to be borne by the employee, two-fifths by the employer and one-fifth by the state. The administration is to be vested in mutual associations of employers and employees organized according to trades and localities. The management was to be joint and under the general supervision of a state social insurance commission.

It is exceedingly unfortunate that in these days of social progress, a representative medical society should reject with an air of finality a measure designed to better health conditions in the state. If health insurance

were an absolute innovation, one might possibly understand such action to be due to an exceedingly conservative position on the part of the profession. Health insurance, however, is an established fact in almost all the civilized countries in Europe and has been successfully inaugurated by many states in the Union. Despite the objections interposed by physicians some bill of this nature will probably be successfully enacted sooner or later in every state.

One need but recall the tremendous opposition of the British Medical Association to the passage of the British Health Insurance Act to realize the futility of endeavoring to retard the wheels of progress. Today, the physicians in Great Britain are rejoicing in the success of the comparatively new legislation for despite the war they are far richer than they were previous to the establishment of the panel system.

Here again is another illustration of the blindness of organized medicine to social ideas. The leaders in the profession have a tremendous responsibility to disseminate the necessary information to create a spirit of voluntary cooperation on the part of the profession. In the particular bill in New York State, the items dealing with fees were intentionally omitted in order that they might be written in after conference between members of the profession and the American Association for Labor Legislation.

**Health insurance represents a high type of public health measure** of the utmost importance. It would provide the machinery for securing data with reference to morbidity that would serve as the groundwork for the most rational educational developments for the prevention of sickness among our industrial workers. It places a premium upon health in that the employer is vitally

interested in maintaining the physical fitness of his employee. In consequence, labor would be more rigidly protected through the introduction of sanitary methods and hygienic precautions designed to protect the welfare of employees. Health is more likely to be conserved when the industrial world realizes that health has a distinct cash value not merely to the employee but to the employer as well, and more particularly to the state which also is made a participant in contributing to the insurance funds.

At the present time, a large percentage of the workers of this country are dependent upon public or private charity when disabled by diseases for which they are not primarily responsible. The great burden of losses now borne entirely by the workmen should be distributed over the entire community which is to no small extent responsible for existing disease. The large group of toilers who are unable to avail themselves of adequate and timely medical assistance are today penalized with continued ill health by reason of their unwilling poverty. In turn, the wide distribution of unnecessary disease destroys the economic balance of families in the small wage earning groups and reduces them to a state of poverty and dependence—to the consequent damage, not merely of the family but of the entire community.

The experience of foreign nations, particularly Germany, has demonstrated that provision for sickness through an insurance system contributes to the general prosperity; that a larger proportion of workers are at all times available; and that the physical standard of the community is raised through its development.

**The average wage earner** cannot afford to carry insurance against sickness. When

a compulsory health insurance is enacted society assists the individual not merely in carrying the financial cost of the particular disease, but by securing a more prompt restoration to health of the individual without permitting other members of the family to suffer unnecessarily from anxiety, malnutrition and the various deteriorating results of pecuniary loss. It must not be forgotten that there are at all times about ten individuals suffering from non-fatal illnesses for each death registered or occurring without official registration.

Historically, the beginnings of sickness insurance antedate those of insurance against accident or any other form of social insurance. Where no organized systems of health insurance exist, a considerable part of the relief, medical and social, falls upon public or private relief agencies and virtually society bears the cost. It is far more rational to recognize the part the state should play in the protection of its citizens in the first instance and thus properly develop a type of insurance which will give the maximum benefit to those whose financial status most requires it. In so far as the state, the employers, and the employees mutually participate in the organization and supervision of health insurance, the rights of all factors are protected and the special interests of each group receive proper consideration.

To these three groups, one may add the particular interest of the medical profession. Whether the medical ideals be altruistic and the desire to secure health for all persons predominates or whether the motivating impulse is bound up in the financial benefits to the profession, the end result is the same. A well developed system of health insurance is bound to result in advantage to physicians. It will remove from the category

of dispensary patients many workers who now are forced to resort to such institutions because of their inability to pay a private physician. It is obvious that this means an increased proportion of the individuals enabled to take advantage of private physicians, in fact compelled to accept the administrations of qualified physicians in order to secure the benefits of the insurance. Investigation of sickness in Rochester by Frankel and Dublin, (*Public Health Report*, February, 1916) revealed the fact that without distinction of disability only 61 per cent of the cases of sickness had secured the services of a medical attendant. Only 50 per cent of the total number sick were in the care of physicians outside of institutions. Bearing these figures in mind a new medico-social meaning is to be derived from contemplation of Section 9 of the model law that has been proposed: "Medical, surgical and nursing attendance and treatment and all necessary medicine shall be furnished from the first day of sickness for the period of continuance of sickness, but not to exceed twenty-six weeks from beginning of disability in any one case. If medical, surgical and nursing attendance and treatment and medicine are not furnished, the carrier must pay the cost of such service actually rendered by competent persons but not to exceed in any week one-half of the weekly cash benefit to which the sick person is entitled."

Inasmuch as the present law was introduced in the New York Legislature without hope or expectation of its success, its general purpose may be said to have been educational. Unfortunately, this intent was not achieved in so far as part of the medical fraternity was concerned. Because no fee bill was attached, the County Medical Society rejected the idea. The distribution

of the economic loss from sickness will eventually be properly and justly distributed, wherefore physicians should be active in co-operation instead of with strabismic vision seeking to delay the day of its arrival. Health insurance is economically honest. It is a sound public health policy and is a much needed social measure. It is designed to protect society in a constructive manner. Physicians should rally to its support, encourage its progress, and facilitate its wide extension throughout the states where laws of this character have not been enacted.

#### **Children's Nose and Throat Clinics.—**

The establishment of special clinics for the treatment of school children has been receiving unusual attention. The importance of remedying, as far as possible, the physical defects of school children appears to be basic work for health and education. In an attempt to attack the problem of hypertrophied tonsils and adenoids, the New York Health Department had maintained five clinics for the treatment of nose and throat conditions. Unfortunately, their discontinuance was made necessary by a curtailment of funds for these items in the annual budget.

Considering that the school population annually examined presents practically 10 per cent. of children with hypertrophied tonsils, it would appear essential that adequate facilities be provided for giving the surgical treatment indicated; otherwise the results of medical inspection count for little.

In *Reprint 41 of the Department of Health* on "Free Municipal Clinics for School Children," J. H. Berkowitz points out that the Health Department Clinics were of marked service in the care of 18,764

children registered during 1912, 1913 and 1914. During this period of time 9,770 operations were performed while the treatments numbered over 61,000. The question naturally arises, had the special clinics not been created would it have been possible for the children thus found defective by medical inspection to obtain adequate treatment in the general hospitals and dispensaries? Is any attempt made to increase their force and facilities so as to take care of the large number of school children, whom the Health clinics can no longer treat? The answer regrettably is no.

It is to be regretted that the out-patient clinics of New York City are unable to provide suitable nose and throat clinics adequately equipped to meet the demands upon them. In 1913 the Section of Laryngology and Rhinology of the New York Academy of Medicine expressed the opinion that tonsillectomy and tonsillotomy are operations requiring hospital facilities. Obviously, the great majority of dispensaries cannot provide hospital care, even for the twenty-four hours requisite for treating children after operations on the nose and throat. The all too common practice of removing tonsils and adenoids without an anesthetic precludes the careful surgical removal of these structures necessary to establish a cure.

**The Obligation of Municipalities.**—Municipalities that recognize the importance of medical inspection, in a sense assume an obligation to provide the opportunity to needy children that remediable defects may be properly treated. If the philanthropic institutions of the community are hampered by lack of funds or for other reasons are unable to supply the necessary equipment under experienced and cap-

able operators, the responsibility for so doing obviously falls upon the municipality. To increase the capacity of municipal clinics might provide in part for the emergent treatment wherever necessary, and special children's clinics might be developed under their auspices for continuing the type of nose and throat work that is apparently called for.

Much of the advantage of parental education as to the importance of the physical care of their children is sacrificed when it is a practical impossibility for parents to carry out the suggestions and advice given by the Department of Health. The cost of operations is prohibitive to a large section of every community. If poor parents are willing to allow their children to be operated on their lack of resources should not be further complicated by a lack of clinical opportunities.

Considering merely the specific defects of hypertrophied tonsils and adenoids, it is at once recognized that the resultant disabilities are evidenced not merely in terms of health, but in terms of education. Dr. Ayres has pointed out (*Laggards in Our Schools*, 1913) "That hypertrophied tonsils and adenoids have a distinct bearing on retardation seems to be clearly indicated by the fact that the former are found in 26 per cent. of the dull children and only 12 per cent. of the bright ones, and in the case of the latter the percentage falls from 15 to 6 per cent. In each the falling off is sharp and consistent as removed from the total normal and bright groups. It is too consistent to be dismissed as incidental or non-significant.

Appreciating the relation of tonsils and adenoids to otitis media, tonsillitis, diphtheria and similar conditions influencing the health of children, it is patent that the subject of municipal attention to the problems

surrounding tonsils and adenoids merits hearty support. The main question to be determined is not whether children's clinics shall be established under the Department of Health or the Department of Education or under the auspices of private philanthropies, but how quickly can adequate facilities be provided from any source? It is vitally important, not merely from the point of physical development, but from the educational aspects that hypertrophied tonsils and adenoids should be removed as early as possible. In this way children are protected from the serious handicaps which might result from defective speech, increased nervous irritability, possible deafness, educational retardation and even the suspicion of idiocy.

At some future time the writers on educational hygiene will indicate the increased advantages accruing to school children by reason of the institution of medical inspection, school nurses and children's clinics. In the meantime, the medical fraternity is placed in the embarrassing position of advocating a line of treatment for which inadequate facilities exist under the present arrangement of out-patient work.

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**Probation.**—Considering the large number of medical problems entering into the general question of probation, it is astonishing to note that the *Proceedings* of the Seventh Annual Conference of the National Probation Association held in Baltimore in 1915 apparently ignore this fact. Among the officers of the Association or the members of the Executive Committee no physician's name appears. In the list of persons who discussed the vital problems of probation, physicians' names are conspicuously absent. Among the topics discussed no problem of the medical phase of probationary work

is given consideration. The splendid paper dealing with the "Greatest Needs and Difficulties in Probation Work" and the discussion following it apparently uncovered naught of medical significance.

"Probation in the United States" does present in an academic way some of the facts and problems of our developing humane probation system. From the standpoint of the technic of probation there is much to be said on the methods of appointing probation officers and the relative place of the volunteers in the system. The many difficulties of cooperation for excellent probation work requires mutual understanding of the motives, purposes, interests and capabilities of various types of social agencies, among which should be numbered the numerous medical institutions now extant.

Children have long been divided into defectives, delinquents and dependents. The nature of the medical service required, however, naturally varies in the efficient probation work necessary to give probation officers an intelligent grasp of the particular situation confronting them; requires not merely a rough and ready Binet testing of the child, but a thorough physical and mental examination. Whether this examination should be given before the judge exercises his powers of parole or commitment, or after sentence has been pronounced, is a question still open for discussion.

The extent to which a probation officer can map out his plan for character reconstruction naturally is conditioned by the physical, mental and moral attributes and characteristics of his charge. In juvenile delinquency, particularly, the greatest opportunity for restoration to normality depends upon a thorough study of the underlying conditions which may be related to

the child's physical or mental state. Only after the medical and psychological diagnosis has been established can a rational, well organized, systematic plan be formulated. Herein one sees the valuable contribution which medical men may make to the probation work of the country. The wisdom of cooperation in developing the probation work in this country is obvious. It would be exceedingly unfortunate under such circumstances to have the medical profession unsolicited on the one hand, or unresponsive on the other, to the consideration of the problems which are related to and grow out of the development of probation work.

#### **State Health Regulations for Schools.—**

In the United States, education is regarded as a state function. Compulsory education laws widely existent represent the crystallization of legislative opinion that the state is the protector and guardian of childhood in matters relating to education. It would appear beyond argument that compulsory school attendance places a marked responsibility upon states to provide the most healthful environment in the schools so as to safeguard and protect children from infection, incident to contact with other children, and from defects arising from maladjustments of school furniture, inadequate ventilation, and insufficient lighting.

Among the earliest laws relating to education are those providing for vaccination as a prerequisite to school attendance. This specific law has been thoroughly tested out in the courts and its constitutionality repeatedly affirmed. The general health regulations as presented in *Bulletin No. 47, 1915*, of the Bureau of Education, *Digest of State Laws Relating to Public Education*, indi-

cate a wide variety of functions which have been put upon local communities in order to insure improvement of health conditions in schools.

**A favored regulation** appears to be designed to secure the abolition of a common drinking cup. Some of the general health regulations reflect peculiar local conditions, some of which are as difficult to understand as state laws.

Louisiana penalizes spitting upon the floor or walls of any school-house by a fine of \$5 to \$25.

The Virginia law demands that "teachers shall require of pupils cleanliness of person."

North Carolina places a responsibility upon county physicians for the sanitary inspection of all school-houses and for examining every child reported by teachers as probably defective in conditions of its eyes, ears, nose and throat. He also is charged with the duty of endeavoring to have examined the feces of every child suspected of having hookworm disease. The particular needs of North Carolina indicate the wisdom of the last provision.

Indiana is made unfortunately prominent by a law requiring the teacher to dismiss the school when a temperature of 70 degrees cannot be maintained. The regulation is not permissive but mandatory. There is far less sense in this temperature regulation than in the one requiring that all school-houses shall be cleaned and disinfected at least once a year. It is a sad commentary upon school cleanliness that the latter provision is deemed necessary.

Connecticut possesses one of the few regulations demanding that school houses shall be provided with a sufficient number of water closets or privies.

Massachusetts has enacted permissive legislation enabling any city or town to maintain one or more dental dispensaries for children of school age. A still more advanced regulation permits a city or town to "provide meals or lunches free or at no more than cost price to children attending public schools." This regulation, however, must be submitted to the voters at a regular election after a petition signed by at least 5 per cent of the voters is filed with the city or town clerk. This form of legislation is somewhat patterned after the English law relating to the subject.

Throughout the states there are more or less general regulations providing for informing the school authorities of the existence of contagious or communicable diseases. In Idaho, the owner of the house wherein resides a person with a contagious or infectious disease is to give the notice to the clerk of the school board.

**The main phenomenon worthy of note,** however, is the growing tendency of states to enact health regulations in connection with the problems of state school supervision. The most extensive enactments deal with physical examination and medical inspection, concerning which there is some diversity in form but the obvious intent is common to all.

In the New York State Law "medical inspection shall be provided for all pupils attending public schools except in cities of the first class; registered trained nurses may be employed for public schools; for purposes of inspection, school authorities shall appoint and fix salaries of school physicians." The Commissioner of Education may adopt rules and regulations with the advice of the State Commissioner of Health for the enforcement of medical inspection pro-

visions and he may even withhold public money from any district which wilfully refuses to or objects to comply with such provisions.

While the beginnings have been made, careful study indicates a lack of uniformity in health provisions and indeed a lack of identity of viewpoint on the part of state officers in determining their rights and duties with reference to the school population. It is not fair to criticize harshly those states whose laws are deficient because the impetus for such state provisions has not been given by school authorities nor indeed by the citizens in general. Long steps in advance, however, have been taken and the trend of public opinion is gradually impelling local school boards to take a wider view of the health conditions existent in their communities.

When it is recognized that the child in health is most educable and when it is appreciated that financial savings can be effected by raising the health status of the school population, state regulations will be demanded as measures of economy. The maintenance of health merits consideration for its own sake, but until such time as this idea becomes part of the general science, health measures must be demanded if only for purposes of financial retrenchment or to secure more rapid educational progress.

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**The teaching of therapeutics** should constitute an important part of the education of the medical student. It should have an equal place on the curricula of our medical schools with surgery, gynecology or obstetrics.

This seems, at first glance, a superfluous statement, but it is not as we shall shortly

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## ***WAITING FOR THE DOCTOR!***

*"Gradually but none the less surely the opinion is growing that many a bad habit or criminal impulse can be laid at the door of some physical abnormality or defect—some deranged or perverted function. The accumulation of evidence certainly points in this direction and the more one studies the delinquent and defective the more clearly it appears that these unfortunates are indeed 'waiting for the doctor'—and the doctor to come—will come."*

show. Either the practical interest in therapeutics of those in charge of the programs of some schools is abnormally insignificant, or there is "so much to be taught in the limited time at our disposal that we have not the time for all the subjects that we would like," as one prominent medical educator expressed it. If this is true—and we have personal reasons, which time has not yet effaced from our minds, for agreeing with this gentleman—why not devote a little less time to some less important subject and give the all-essential study of the treatment of disease a little more attention?

Is not the "how" of caring for the sick fully as important as the "why" of their diseases? Seemingly not, for we recently read that the chair of therapeutics had been abolished at one of our most famous seats of medical education. While we were recovering from this we learned that another important "Class A" school devotes no less than 130 hours to such a comparatively unprofitable subject as pharmacology, while therapeutics still demands 32 hours, though we should not be surprised to hear that this woefully short period has been reduced or abolished altogether.

Why should the budding medico be expected to gain his fundamental knowledge of the treatment of disease in "the University of Hard Knocks" as the school of experience may be so often rightly called? Or, on the other hand, why should the student be dependent upon what he picks up in conversation, in his current reading or from the representatives of the manufacturing pharmacists?

We are always willing to admit that the teaching of medicine has gone through a period of remarkable evolution in the past 25 years; but as far as therapeutics is concerned, to say the least, the young fellow

who took his training in the back room of the "surgery" of a hundred years ago, had a much more intimate and useful knowledge of practical therapeutics than the recent graduate of a college where this subject is entirely omitted from the calendar.

It is true that at many of the best medical schools, a fifth, hospital, year is now obligatory, and naturally during this time a more comprehensive knowledge of the intricacies of this subject is obtained; but how much better and more practical would it be if during the last two or even three years of his medical course, 150 hours, let us say, were devoted to the study of the fundamental principles which underlie the response of the organism to the various measures with which we now treat disease!

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**Reduce Infant Mortality.**—The infant mortality rate is generally falling. A comparison of the figures of some of the larger cities of the United States for the years 1914-1915 bears witness to progress along this line. Some statistics are presented at this time to serve as the greatest stimulus for future activity and as an index of the possibilities of the reduction of infant mortality in cities where social and medical forces are not yet organized to bring about this desired end.

#### INFANT MORTALITY.

	Rate 1914	Rate 1915
Chicago .....	132.7	102.6
Philadelphia .....	121.3	104.9
St. Louis .....	103.4	82.1
Baltimore .....	154.6	119.8
Pittsburgh .....	114.7	107.7
Buffalo .....	124.5	108.3
San Francisco .....	77.8	70.8
Milwaukee .....	97.3	94.4
Cincinnati .....	94.6	78.9
Newark .....	99.4	83.6
Los Angeles .....	73.2	67.4
Indianapolis .....	143.5	131.6
Louisville .....	115.2	99.2
Denver .....	105.2	93.7

**The organism causing scarlet fever** has long been in dispute. Numerous observers have claimed the discovery of a definite bacterium in the secretions of the nose and throat, or in the desquamated material from the skin, but these have all lacked confirmation. Now come Drs. Mallory and Medlar the well known pathologists of the Boston City Hospital who report in the *Journal of Medical Research* (March, 1916) the isolation of a bacillus which they feel certain is the causative germ of scarlet fever. While it will be necessary to wait the corroborative evidence of other investigators, the reputation and standing of Drs. Mallory and Medlar endow their discovery with especial dependability. According to these workers, it is largely owing to the short life of the actual germ that it has evaded discovery so long. They are found soon after the skin eruption appears and usually find lodgment first in the tonsils or at the root of the tongue. The germ is less virulent than the diphtheria bacillus, although it infects practically the same localities.

It was first discovered in the crypts of the tonsils of a child the second day following the appearance of the skin eruption. Later it was found that the germs were fairly numerous all through the exudation and abundant in the free pus present in the lumen of the crypts.

Contrary to the usual supposition, the desquamative material from the skin is not infectious, for Mallory and Medlar state unequivocally that when desquamation takes place, the germs in the body are dead. This view has been held by a good many clinicians for some time, and the principal source of danger has been known to be the secretions from the nose and mouth.

The paramount feature of this discovery of the scarlet fever germ is the opportunity

afforded for developing a vaccine for both immunizing and curative purposes. If the findings of Drs. Mallory and Medlar are confirmed, as we have no doubt they will be, America will have the credit of the conquest of one more dread disease. It is a source of considerable satisfaction to American physicians that so many of the worth while discoveries in modern medicine have been "made in the United States." They form a splendid answer to the accusation some of our European confreres are so fond of making to the effect that American medical science is superficial and barren of research!

As a matter of fact, if we were to strike a balance of the great contributions made to medicine and surgery in all their branches during the past two decades on both sides of the Atlantic, the scientific world might be much surprised to learn how great and far reaching have been the activities of the American medical profession. It is entirely probable that the world at large owes more to American medicine than it realizes. It is just such work as that of Drs. Mallory and Medlar—void of sensationalism and self advertising—that is gradually extending the outposts of medical science and making more certain day by day the ultimate mastery over the common enemy—communicable disease.

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**The Harrison Anti-Narcotic Law**, as we have said on numerous occasions is so laudable in its purposes, that every earnest, thoughtful person is bound to support it in its main or fundamental aspects. Our appreciation and approval of its intent, however, need not blind us to the deficiencies of the law as it now stands, and as we have also pointed out in former discussions of this important piece of legislation, there are

certain defects and shortcomings which it seems to us are so basic and vital that the law can never perform its full function until they are corrected and supplied.

The subject, as we have repeatedly intimated, is one of the most important confronting the profession and the whole American people. And it is because of this importance that the most consistent and painstaking attention must be devoted to the problems which the law has created.

Let it not be understood that the criticisms we have offered—and shall continue to offer—are tinctured with malice. We intend rather that they shall have, if possible, some constructive value, for now that the national government has undertaken the solution of the problem, we hope to see every phase of the question properly disposed of. To this end, it is the duty of every earnest, thoughtful person to point out not only the defects of the law as he sees them, but also ways for increasing its efficiency.

To us, one of the most serious deficiencies of the law is the lack of any provision for caring for confirmed addicts. Individuals thus afflicted need institutional care and treatment. Without this, the restrictions of the law are certain to work severe hardships on an unfortunate class it was never intended to injure or punish.

It is unfortunate that the medical men of the country—or, at least, those familiar with the subject—were not more freely consulted in the course of the construction of the law. It is equally unfortunate that physicians have been so loath to express their views since the law was passed. Such silence is always misinterpreted for it is taken as approval. Hence we learn with much satisfaction from a recent issue of the *Medical Record* (Mar. 4, 1916) that five prominent physicians of Atlanta, Ga., have addressed to one of their senators at Washington, a letter calling attention to the fact that although nine months have elapsed since Congress passed the Harrison Anti-Narcotic Law, no steps have as yet been taken for the proper care of the sufferers addicted to the use of habit drugs. While commanding the law, these physicians state their belief that the Federal Government should devise some plan to care for these patients, and that a national hospital working in conjunction with the Internal Revenue Department would be more satisfactory than state and

county institutions. The note questions whether if Congress had realized the gravity of the new law, provision for the care of drug cases would not have been made in the original act. The letter is signed by Drs. Samuel A. Visanska, Hugh I. Battey, Dunbar Roy, James N. Ellis and Allen H. Bunce.

All praise to these earnest physicians, who have had the courage and will not only to point out a serious defect of the law but what is more important, to make a comprehensive effort to secure its correction. If groups of medical men all over the country would make a practice of addressing their senators and representatives on all matters concerning the public weal, good beyond calculation would be accomplished and the medical profession would make its influence felt.

A slogan for the medical profession which should be constantly before us is "write to your senator."

Letters signed by one person will have little weight but with five signatures they will never be ignored, or dismissed with a mere acknowledgment. In a word, "write, brothers, write—but remember in union there is strength." A letter with one signature is a request, with five, it is a command.

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To our esteemed contemporary, the *Medical Record*, we extend heartiest birthday greetings. On the first of this current month, it reached the ripe age of fifty years. The event is noteworthy, not alone because of the position which this mature and universally respected journal occupies today in American medical journalism but also because of its honorable past, full of notable works, and certain details of its management and direction which lend distinction to its age. Thus it is a fact of much more than passing interest, that the *Medical Record* can claim to have had throughout its fifty years of existence but one publisher—the present owners, Messrs. Wm. Wood & Co., and but two editors, the first Dr. Shrady, who officiated at its birth and directed its welfare for thirty-eight years, and the second, Dr. Stedman, the present editor who has been in charge of its affairs ever since. To have had such a publisher and such editors has given the *Medical Record* unique

advantages from every standpoint, and it is not surprising that it has played so prominent a part in American medicine and surgery. Indeed, to those who have had the privilege of knowing Dr. Shrady and Dr. Stedman, it would have been surprising if the *Medical Record* had failed to reach and maintain the position it has held so consistently from the first. Fortunate indeed have been the medical men of the country that Dr. Shrady was persuaded March 1, 1866 to take up the direction of a publication destined to do so much in placing medicine on its present plane. To his genius, erudition and broad professional attainments the great influence of the *Medical Record* was due. So much was Shrady the *Medical Record* and the *Medical Record* Shrady, that when his death occurred a dozen years ago it was freely predicted in some quarters that the hour of the journal had struck with his passing. None who knew the quiet scholar who succeeded Dr. Shrady had any doubts, however, as to the future of the *Medical Record*, and those who did not know him soon realized that there was a master hand at the helm. Under Dr. Stedman's guidance the *Medical Record* has kept steadily onward, preserving its traditions, splendidly fulfilling its mission and carrying forward its message to the profession with the steadfast purpose, courage and conservatism that so long ago established it as one of the great scientific publications of the world.

As the *Medical Record* enters upon another half century of faithful service, we wish not only to record our admiration and esteem for what it has accomplished in the past, but to express the earnest hope it may be as fruitful and successful in the years to come, and go forward to new triumphs, and new honors for the glory of American medical literature.

message in each instance was to urge the most careful diagnostic investigation of such simple symptoms as headache or hyperpepsia, neurasthenia or rheumatism and, of course, many other seemingly unrelated symptoms. When it is recalled that among these speakers were L. F. Barker of Baltimore, Joseph Collins of New York and Gustav Baar of Portland, Ore, there is an added importance and significance to this matter and it will be found that the experience of these internists—that many of the earliest manifestations of syphilis, particularly of the nervous system, show themselves in some seemingly insignificant conditions and are not attended with the usually expected pathognomonic subjective and objective symptoms—may be duplicated equally often and advantageously in general practice.

These warnings apply in every phase of practice, most frequently, perhaps, when the disorders are of a nervous character; but also in every form of medical disorder from the long and diversified list of heart and vascular diseases to the chronic metabolic derangements as diabetes, rheumatism or disease of the glands of internal secretion.

With all the diagnostic means at our disposal there should be no difficulty in recognizing syphilis early; and when this is done it saves months and even years of aimless treatment, and at the same time puts a very different aspect upon the prognosis. In every medical case where there is the least obscurity and in many where the diagnosis of some condition other than syphilis is clear, the Wassermann test should be made, and this test should not be left until it is really a sort of diagnostic last resort, rather it should be a routine procedure in the investigation of practically all medical disorders.

One cannot but be impressed with the increasing interest in the laboratory diagnosis of syphilis. The Wassermann test and its various checks is "of enormous importance," to use a phrase of Collins' remarks, and with it one can now also have recourse to other important corroborative measures as Lange's colloidal gold test and the examination of the cerebro-spinal fluid. In all cases where there might be a possible underlying syphilis, no matter whether the history or personality of the patient suggests it or not, at least one of these tests should be made.

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**Unsuspected syphilis** is a more important underlying cause in the production of many apparently unrelated disorders than any other factor; and those high up in the medical profession seem to be more interested in this subject than ever before. In the past month or two no less than five important papers have been read on very slightly differing phases of the same subject. The

Many times a negative Wassermann reaction with the blood-serum does not necessarily mean a negative diagnosis, especially in certain nervous disorders, and in many disorders of this character a spinal puncture should be made and not only a Wassermann test of the spinal fluid made but the other laboratory tests of this fluid equally carried out. Frequently the spinal fluid will reduce Fehling's solution; its globulin content will be considerably increased, and a microscopic examination of its cellular elements will show a marked pleocytosis—an increased cell count. All these diagnostic findings may be expected in early cerebro-spinal syphilis and they may be present when the other usually expected clinical and laboratory diagnostic signs of syphilis are all absent.

Many years ago Sir William Osler used to emphasize the importance of obscure syphilis and admonished his students in no uncertain terms to remember the frequency and diversity of the manifestations of this protean disease; and only the other day his successor in Baltimore, Dr. Lewellys F. Barker, speaking before the New York Academy of Medicine, said: "The more my experience grows, the more I am inclined to take as a diagnostic aphorism, 'When in doubt have a Wassermann test made; when not in doubt still have a Wassermann test made.'"

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**Accidental advances in therapeutics** are more frequent than we sometimes think. It is surprising how many times the element of chance assists in establishing a new therapeutic procedure; and while advances made in this manner cannot well be increased by the methods which make for progress in physiology or pathology, they are none the less helpful and advantageous to medicine as a whole.

By far the most frequent manner in which such advances are made is the casual discovery of radically new uses for comparatively old remedies. One can recall numerous instances in practical therapeutics, the reiteration of a few of which may be of interest.

Since ipecacuanha was first described and used a far back as the 16th century, it has been given on and off for intestinal troubles

and, later, for bronchial affections. Only during the past two or three years has its value as an antihemorrhagic or as a pyorrhaeicide, been known. Both these important fields for the administration of emetine were discovered by accident, and the recent clinical report of several favorable results following its use in psoriasis (when it was really given for the treatment of a concomitant alveolitis) indicates still further possibilities for the application of this remarkable and popular drug.

Another time-tried remedy which is used much more frequently in the Orient than in this country—santonin—is now said to exert another and widely differing therapeutic influence. During its administration for the expulsion of intestinal lumbricoides, a long-standing gleet which had resisted previous treatment, was successfully controlled. While this is an isolated instance, who knows that santonin may not become a standard remedy in the treatment of this intractable disorder, and thus find a much more extended field of usefulness in this country?

In organotherapy the now well-known influence of the principle of the posterior lobe of the pituitary gland in obstetrics was discovered accidentally by Dale, who was making some comparative studies of ergot and other uterine tonics in his laboratories. Its influence upon uterine muscle was accidentally observed and a casual reference to this gave Blair Bell the idea which is now put to such frequent and excellent use, not merely in obstetric practice, but in many other conditions in which the tonicity of unstripped muscle can be stimulated with advantage.

Even the therapeutic influence of quinine is now being better understood, for beside its specific action in malaria, we now hear that it is being successfully used to increase resistance to bacterial invasion and thus serve as a useful adjunct to the orthodox treatment of infected wounds. This advance, if it is proper so to call it for this particular use of quinine is still in its experimental stage, was the result of treating malaria associated with severe wounds and noting that healing was favored under the influence of the quinine.

One cannot tell when he may make an advance in therapeutics by accident. Without a doubt the keen observer is more like

to do this than his less observant colleague. Shall we not keep our eyes open for casual by-effects of our every-day treatment, always remembering the Greek adage: "The greatest events often arise from accidents?"

### **Human Blood Cells at Your Druggist's.**

—One of the most recent life-saving suggestions comes from Dr. W. H. Burmeister of Chicago, who recommends the use of human erythrocytes—through indirect blood transfusion—simultaneously with the exercise of an approved method of artificial respiration, to victims of carbon monoxide poisoning.

In an article in the *Journal of the American Medical Association*, the doctor draws some broad conclusions from his extensive experiments upon animals, which encourage him to recommend the establishment of emergency stations where human erythrocytes may be obtained quickly and utilized in preventing death from asphyxiation due to inhalation of carbon monoxide.

Theoretically, of course, the introduction of new and active erythrocytes "of the same species" into a human vascular system in which some or not too many of the red corpuscles are loaded with carbon monoxide—with other blood elements uninjured—would supply the ideal carriers of the life-saving oxygen. Unfortunately, however, the hemoglobin of the red cells has a much greater affinity for carbon monoxide than for oxygen or for carbon dioxide. All physicians are aware that defibrinated blood—such as our Chicago colleague seems to recommend—always contains the enzyme, fibrin-ferment. Therefore, there is always that danger of intra-vascular clotting to be feared when the blood of one person is injected into the circulatory system of another, even when the donor subject is known to be healthful and his blood has been whipped to prevent coagulation.

The subcutaneous or intravenous injection of blood derived from some other animal is open to the same objection and has the other recognized disadvantage of exciting globulicidal action; that is, the antagonism between the armies of cells of the two species that converts the vascular system of the victim into a battlefield upon which is waged the death struggle for su-

premacy. Destruction of one or both of the groups of cells is invariably the result.

The doctor recognizes the danger from this globulicidal action, apparently, in confining his recommendation to the injection of human erythrocytes. It seems to be assumed that cells from the *genus-homo* would be free from the objection attached to animal red cells.

This brings us to our Rubicon. It is contended by most advanced thinkers, we believe, that no two people are alike as are any two animals of the same species. When the man stage of evolution is reached the voice of individualism proclaims a superior being as compared with the animal, and its expression makes every human being different from every other human being. Indeed, it may be said that there are as many species in the human kingdom as there are individuals. This individualism, we contend, is as potent in the blood as it is in the brain and a fuller acquaintance with the functions of the elements of the blood, probably, will make this fact more fully apparent to us.

"Blood is a very peculiar essence," said Mephistopheles to Dr. Faust. The fallen angel, doubtless, had reason to know. The "vital fluid" in some respects is still a mystery even to medical savants. Some day, however, it will yield the remainder of its secrets to the perseverance, determination, patience and assiduity of science; but science itself, there is reason to believe, will have then progressed to a higher altitude than it has attained today; to the everlasting benefit of mankind.

It is always inspiring to take note of any sincere effort to benefit the human race. Whether the substance used or the methods proposed, when put to the test prove successful, is another matter, to be acclaimed or to be transferred to the storehouse of impractical theories, as the case may be. A later day and a fuller knowledge, however, may turn some of even the rejected theories into the ranks of veteran soldiers on the firing line of the army operating against disease. On the other hand, the theories that fail to pass the test of practicality, after repeated and patient trials, must die. Nature leads with a kindly hand but her decrees are inexorable and she

makes obeisance only to the master of her secrets.

Many of the failures of direct and of indirect blood transfusion, there is reason to believe, are due to a modified globulicidal action or to antagonistic relationship existing between the two sets of plaques resident in the two blood streams brought into contact by the process of transfusion.

Would it not seem that there are more chances of success in combating carbon monoxide gas poisoning with a normal salt solution—into which is incorporated some substance, if such is available, with a greater affinity for carbon monoxide as compared with hemoglobin—than by the erythrocytic method, and with infinitely less danger to the patient?

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**"Waiting for the Doctor."**—Never was there a time when the earnest physician filled a more important place in the world than he does to-day. While half of Europe is locked in a death struggle with the other half, the medical men of the respective nations are faithfully at work striving with all kindness and sympathy to relieve the hurts and heal the wounds being made, alas, in anger and hate. In the life of the doctor there is no room or place for animosities or hatred; his labors are so distinctly merciful in character and so specifically devoted to alleviating suffering that his work and all he stands for must ever be the very antithesis of war. No, the doctor's life is too occupied with healing and repair, the soothing of aches and pains, the prevention of disease and suffering, and the promotion of human welfare to leave any time or energy for anger or malice. In other words, the true physician's thought and efforts are so essentially associated with—and devoted to—*constructive* purposes that he cannot afford to spare a moment to *destructive* passions.

Truly, there is much for the doctor to do, the world over, from ministering to the war's wounded—to spreading the gospel of clean living and health. Our cartoon this month—one of the most striking we have published—directs attention to two great problems which especially demand the consideration of thoughtful medical men. Gradually but none the less surely the opinion is growing that many a bad habit and

criminal impulse can be laid at the door of some physical abnormality or defect—some deranged or perverted function. The accumulation of evidence certainly points in this direction, and the more one studies the delinquent and defective the more clearly it appears that these unfortunates are indeed "waiting for the doctor"—and the help he alone can give them.

What an opportunity to aid and benefit humanity thus awaits the earnest, conscientious physician!

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**The Schick Reaction in Diphtheria Suspects.**—In retrospecting the accomplishments of the past year one is struck by the important place that the Schick reaction has taken. This is one of the few real advances recently made in medicine, and by means of this test we are now enabled to ascertain the susceptibility or immunity of an individual to diphtheria.

This test has been very thoroughly investigated and its reliability is now well established. Just last month (February) the Department of Health of the City of New York inaugurated the free distribution of outfits for performing the Schick test and they may now be obtained at seventeen conveniently located depots throughout the city. This policy might be duplicated far and wide with considerable advantage and actual economy, for it will be recalled that as the reaction differentiates those that are immune to diphtheria, it obviates much unnecessary waste of antitoxin, while it enables us to confine our prophylactic treatment to those who need it.

The test is simplicity itself, and despite the fact that it has been mentioned many times we outline it briefly:

A very small quantity of diphtheria toxin diluted to one tenth of a mil (c. c.) is injected into the skin. This produces a raised whitish spot which may develop a characteristic reaction in 24 to 48 hours. If so it is an indication that there is a susceptibility to the disease and a need for immunization, while if there is no reaction the individual is immune.

The Schick test deserves to be applied much more frequently, and Commissioner Emerson's lead should be followed universally.



## THE EXTENSION OF HUMAN LIFE.

BY

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While we are already agreed that human life is extensible, we are not so fully agreed as to the best methods to be employed for extending it. In fact for several years a few students have been suspecting that the work of prolonging life—as it is at present being conducted—is not pursued in the most effective manner, and that, in particular, we are neglecting one of the most if not the very most, promising means of all—individual hygiene.

Our present methods have their roots, for the most part, in the work of Pasteur. Ever since Pasteur made his epoch-making discoveries and uttered his inspiring words, "It is within the power of man to rid himself of every parasitic disease," health workers have sought to secure their results almost wholly in the single direction which he indicated, i. e., by attacking our infinitesimal parasitic enemies.

In the *Report on National Vitality*, of the Roosevelt Conservation Commission, a summary of European life tables shows that human life lengthened during the seventeenth and eighteenth centuries at the rate of only four years per century, and that during the first three quarters of the nineteenth century it lengthened about twice as

fast, but since that time it has been lengthened more than four times as fast or about seventeen years per century.

These figures would seem large enough to satisfy the most ambitious, and certainly, if life could continue to lengthen, at the rate of seventeen years a century, after a few more centuries the world would be populated mostly by Methuselahs.

But our prospects are not so bright. In fact there is a large element of gloom. When we analyze the present improvement, we find it is due chiefly to a decreased loss of life from infection before middle age, in spite of an increased loss of life, after middle age from degeneration. Such a process bids fair soon to change our net gain in the average life span into a net loss, but the truth is, we are witnessing a race between two tendencies, a reduction of the acute infectious diseases, such as typhoid, and an increase in the chronic or degenerative diseases such as arteriosclerosis and Bright's disease. By degenerative diseases are meant those which consist in the degeneration or wearing out of the vital organs.

This degenerative tendency seems to be more in evidence here than elsewhere. In Sweden we find the expectation of life increasing at all ages. There, even the nonagenarians of today have more years to live, than did those of former days in the United States.

The fact seems to be that while we are

freer of germs than our ancestors, our vital organs wear out sooner. The degeneration of our bodies, follows a degeneration of our habits. It is especially significant that in England, where the diseases are not increasing, individual exercise, out-of-door sports for the masses, and self-care are, apparently, not declining, and it is still more significant that in Sweden, where there is improvement at all ages, the interest in individual hygiene is the greatest in the world. It is the only country where public health includes private habits and touches the life of the people, especially through the public schools.

Strong corroboration of the decadence in our health is given by the experiences of the Life Extension Institute. Its chief work at present consists of medical examinations, to discover possible physical impairments. These medical examinations are made partly for life insurance companies. They constitute the first general physical survey of sample groups of our citizens and reveal conditions of impairment which are truly astounding. They include about 2,000 medical examinations of employees of the commercial houses and banks in New York City among young persons, mostly young men, with an average age of thirty.

These figures are especially surprising because of the large number of young men and young women suffering from diseases of the heart, kidney, and circulatory system. The fact of great import, however, was that impairment sufficiently serious to justify the examiner in referring the examinee to his family physician for medical treatment, was found in 59 per cent. of the total number of cases!

In other words, considerably over half of the young men and young women in active work, and presumably selected for their

work as especially "fit," were found, although unaware of the fact themselves, to be in need of medical attention, while 37.86 per cent. were on the road to impairment because of the use of "too much alcohol" or "too much tobacco," constipation, eye-strain, overweight, diseased mouths, errors of diet, and other ailments.

It would seem that today men and women begin to die almost as soon as they are grown up, but are dying so slowly that neither they nor their physicians suspect the process, until death stares them in the face. What would we think if such a per cent. of impairments were found in a dairy, or a flock of sheep!

On the principle that "a stitch in time saves nine" the early diagnosis and prompt treatment, in the incipient and easily curable stages of the degenerative diseases should be the next great step forward in the fight for improving national vitality.

No factory owner would allow his machinery to go uninspected until it broke down. Yet that is precisely what we have done with the human machine. Worse still, we have scarcely studied, much less advocated, those simple rules of hygiene, by which alone the degenerative diseases can be prevented. We need to know more of what errors we may be committing according to the laws of physiology.

Is our diet, for instance, too acid and too little alkaline? Do we take our food too concentrated? Are the common drugs we use in beer, cigarettes, tea and coffee, seriously harmful? These and numerous other questions are not yet settled in our minds because most physicians and health officers have not yet seriously concerned themselves with them.

The old idea of the ancient Greeks, of cultivating a sound mind in a sound body

by the exercise of simple personal hygiene through the proper use of air, food, rest, exercise, bathing and wholesome recreation, was utterly forgotten during the middle ages, when, in the quest for spirituality, the absurd doctrine was promulgated that the flesh is gross and in league with the devil. Medieval artists associated saintliness with sickliness and chose consumptives for their models.

We need to formulate scientifically what constitutes a wholesome life and to educate the public on what changes from existing customs are necessary to live that life. Furthermore, in the industrial world we must in some cases compel wholesome physical and mental conditions for our working people. The time has come when science must subdue custom and reason triumph over tradition.

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## THE PREVENTION OF COMMUNICABLE DISEASES.<sup>1</sup>

BY

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If medical men and health authorities would work together more, they could secure the cooperation of the public; then by directing their united energies and activities toward the prevention of the infectious and communicable diseases, and using the present knowledge of sanitary science as they should, results of the most positive and far reaching character would be achieved. We need not expect, however, to suppress or control these diseases without first acquiring a thorough knowledge of their methods

of transmission. Our ideas concerning the transmission of the communicable diseases have undergone many changes within the past thirty years and our knowledge of their mode of conveyance has greatly increased. It has been only a few years since we thought yellow fever was directly transmitted from one person to another. Now the method of transmission of this disease through the mosquito is so thoroughly established not only in the minds of medical men but also among the laity that it scarcely requires reference. Typhus fever was also thought to be indirectly communicated, but now we know that it is conveyed by the body louse. Malaria was thought to be transmitted in some unknown manner through air and dampness. Now we know that it is due to the protozoon in the blood deposited there by the bite of a certain kind of mosquito.

Again diphtheria is probably not conveyed through the air as formerly thought but is only transmitted by direct contact with the secretions from the mucous membrane of the nose and mouth of a person suffering with that disease, or by contact with some article which has been contaminated by these secretions from the patient. Many authorities still consider diphtheria to be an air borne disease, but from my personal observation I am thoroughly convinced that there is no danger of contracting this disease from the air of the room in which a patient suffering from diphtheria is confined. Only a few years ago it was very generally held by the medical profession that scarlet fever and measles were transmitted through the agency of the desquamative material which is thrown off late in these diseases. It is now known that measles is contagious during the first few days of the disease and that it is the catar-

<sup>1</sup>Read at meeting of Memphis-Shelby County, Tenn., Medical Society.

rhal secretions that are most active in conveying infection. Indeed, it is held by some authorities that measles is contagious only in the pre-eruptive stage. This I can hardly accept unqualifiedly since the blood upon examination shows a virulent virus for about thirty-six hours after the eruption appears.

Scarlet fever is very likely transmitted only in the eruptive and febrile stages of this disease, and the desquamation probably has little or nothing to do with its transmission. It is not my purpose to detail the methods of transmission of each contagious, directly communicable or indirectly communicable disease, since these are well known to all progressive medical men. Yet I feel that I should not leave the subject of transmission without mentioning one other disease and its mode of transmission which causes the death of about 200,000 of our own people annually. This is tuberculosis. The three most common methods of transmission of this disease are by inhalation, by ingestion and by inoculation. Inhalation is by far the most frequent method of acquiring tuberculosis. The bacilli of this disease are often inhaled with dust, but the most virulent germs are inhaled in small particles of saliva which have been expelled from a consumptive while coughing, sneezing or talking loudly. The germs of tuberculosis may be taken into the stomach in food which has become infected. Thus dairy products from tuberculous cattle may cause the disease in the human. Inoculation occurs frequently in persons who are called upon to care for consumptive patients; that is, servants who wash cuspidors and other breakable vessels used by them, the germs being carried into the system through small cuts or scratches on the hands or other parts of the body.

Having thus briefly mentioned the method of transmission of some of the more common communicable diseases, it is now necessary to suggest some means through which we can control and eventually eradicate these afflictions. Our efforts cannot help but be successful if the public will cooperate with the health authorities and the medical profession, and our efforts are untiring. Any campaign against the eradication of these diseases must necessarily be largely educational. We must instruct the people as to the ways in which these diseases are transmitted; we must show them how definitely they can be prevented; and finally we must instruct them as to the effective means of avoiding infection. The physician must particularly be impressed with the important part he has to play in promptly reporting any disease which may spread infection. It must be driven home to him that his failure to properly report a disease may be the cause of the spread of infection, and that the blame for such infection will be on his shoulders.

The one disease which we ought to be able to eventually eradicate is typhoid fever, since it is absolutely preventable and its methods of transmission are so definitely known and understood. For quite a number of years health authorities of the various cities and also in the rural districts have directed their efforts and energies toward the control of this disease, but from statistics which I have been able to get, I do not find any appreciable decrease in the number of cases, unless it be in the City of New York where apparently substantial progress has been made. Take our own city as an example; we have a water supply which is unquestionably equal to any in the country. We have a splendid sewer system, we have regular and satisfactory dairy inspections,

we have clean streets and alleys, we have regular inspection of all food stuffs, and of all places where food is prepared and sold, we have a capable corps of sanitary inspectors, and we have waged war on the fly and have tried to eradicate the filth in which he breeds. We treat typhoid fever as a contagious disease, placarding the houses in which patients are confined, and we disinfect after the disease. We issue instructions about the care of the excreta from the patient and its disposal; still we have typhoid fever. I have earnestly looked for the cause of our slow progress against this disease and have concluded that the true carrier and spreader of this infection is the convalescent, and we have failed to keep him under observation long enough. If we would require every convalescent from this disease to observe the same rigid rules which each observed during his active illness, and until the excretions from his body no longer showed typhoid bacilli, we would eliminate the most dangerous and active factor in the continuation of this disease. Another carrier of this disease which often evades us, is the mild case which has not been diagnosed as typhoid. Such a patient often unconsciously distributes the infection broadcast. In this case the responsibility is on the physician and no excuse can be made since the municipality furnishes every possible assistance not only in making his diagnosis but in keeping track of his cases.

I feel that if we continue our sanitary work, therefore, and repeatedly impress on the public the avenues through which typhoid comes and show them again and again how to avoid this infection, while the health department is watching more closely the convalescent, we will surely make headway.

But there is one other step which we should take towards the eradication of this

disease, a step which, in my opinion, will be the most effective means of controlling this disease, and that is the use of typhoid vaccination. This is no longer experimental. We all know from the results obtained in Memphis—as well as elsewhere—what typhoid vaccination will do. If every man, woman and child in the city were vaccinated and revaccinated every three years, and we continue rigidly enforcing sanitary regulations governing this disease, we should, in a very few years, be able to say we have no typhoid in our city.

Malaria, though not a contagious disease, is a preventable one. This malady is so wide-spread that its complete eradication would necessarily be a very large undertaking. We know that the mosquito, which is the carrier of this disease, does its work at night, and only at night. Our plain duty then is to keep this malefactor from our homes. The method of screening which is in vogue here and elsewhere is not satisfactory, the work is not properly done: openings are left and in a large majority of our homes the screens fail to keep the mosquito out. Our screening law should be amended and the new requirements should specify in detail the method of screening. But of far greater importance than screening is the destruction of the mosquito itself and its places of breeding. Our Army and Marine Hospital health officers went to Havana and freed that city of the yellow fever-carrying mosquito—the *stegomyia*. They freed Panama of both the yellow fever-carrying mosquito and the malaria-carrying mosquito—and made possible the Panama Canal. Why then can we not drive malaria from the United States? I would suggest that we appeal to our representatives in Congress to have a law passed and sufficient money appropri-

ated for the eradication of the disease carrying mosquito within our confines. Divide the malaria-infected states into districts small enough to get thorough work done, place a competent health officer in charge of each district, give him an able corps of assistants and require them to drain, oil and do whatever is necessary to eradicate disease carrying mosquitoes and their breeding places. This may sound impracticable, impossible and visionary, and it may never be done, but it should be attempted. The Italian Government drove out the dreaded Roman fever, which is malaria, from Campagna and made fertile farms and beautiful country homes, where once it was uninhabitable because of disease transmitted through the mosquito. The directly contagious diseases, diphtheria, scarlet fever, measles, etc., will be more difficult to prevent, and education is the principal means by which we will be able to get the results desired. In many cities medical school inspection is now required. If these doctors should be required to lecture each week to the children on the methods of transmission of contagious diseases and would teach children how to avoid contracting these diseases, in a few years our people would be thoroughly educated on preventable maladies, and a marked decrease in the number of cases of communicable affections would be seen. These lectures should be a part of each child's education.

The spread of contagious diseases is due largely to what we call carriers. Especially is this true with reference to diphtheria. Often we find the germs of diphtheria or the Klebs-Loeffler bacilli in the mouth of a child whose throat is apparently normal. Through these diphtheria is spread. Frequently during the past few months we have encountered such carriers of this disease.

This is true not only in Memphis, but in almost every other city in the country. If our people had been thoroughly educated these most dangerous spreaders of this dread disease would not have been found among us for they would have by their use of antiseptic sprays destroyed these germs. Isolation and quarantine are the important points in lessening contagious diseases. We cannot expect to eradicate them entirely, but in dealing with contagious diseases we must not overlook vaccination. Before vaccination against smallpox was practiced that disease caused the death of 184 out of each 1,000. Now the ratio is one in 15,000! Vaccination and re-vaccination will confer complete immunity on a community. Antitoxin will prevent diphtheria. Vaccines were first used in scarlet fever in 1905, and with favorable results. It is now claimed that three injections will confer immunity for 18 months. From the published reports which we have it seems that streptococcus vaccine is destined to control scarlet fever.

The prevention of tuberculosis has already been started and the work done is encouraging. The eradication of this disease will take a long time because (1) it is so wide-spread, (2) so many factors contribute to its continuation and (3) the chronic nature of the disease. But the enthusiasm which is seen in the workers against it certainly shows that the work will be continued. Finally, success in prevention of this disease will be seen. It will be quite impossible for me to outline a campaign against tuberculosis. I wish, however, to make a few suggestions which, if strictly observed, would decrease the occurrence of this disease.

1. Education of the people in regard to conditions which predispose to tuberculosis.

2. Strict enforcement of the spitting laws on the streets and in buildings.
3. Absolutely prohibiting the use of the common drinking cup.
4. Compelling all physicians to report all cases of tuberculosis.
5. Requiring all tuberculous patients to be under the care of a physician in the home or in hospital, preferably the hospital, and issuing careful instructions to the family of patients who do not go to the hospitals. If the home surroundings are not proper for the care of tuberculosis, forcing the patient to the hospital.
6. Isolation of advanced cases.
7. Instructions about proper ventilation and encouraging fresh air and sunlight.
8. Requiring all public buildings to be ventilated.
9. Proper school ventilation and encourage open air schools.
10. Prohibit crowded sleeping rooms.
11. Prohibit sleeping in basements.
12. Better hygienic conditions of prisons.
13. Better methods for cleaning public buildings.
14. Enforcing all laws pertaining to tubercular cattle.

While I have mentioned vaccines and serums, I feel that since these are destined to become the curative and preventive agencies upon which we must rely, I should mention some of them which are almost specifics. Vaccination is the inoculation of the body with a virus of a disease of cattle called cow-pox in order to protect from smallpox. Now vaccination is used to designate the introduction of bacteria in the body to produce immunity against certain diseases. We are all familiar with vaccination against smallpox and the results which it has produced.

Typhoid vaccine has saved the city of Memphis from an epidemic of that disease. A few years ago when our water supply was infected and there were being reported as many as 25 cases of typhoid fever a day, we resorted to vaccination with a result that within 30 days normal conditions prevailed.

Typhoid vaccination if made compulsory with the aid of sanitary methods now employed and the isolation of non-carriers, would eliminate this disease, that is to say, there would be about one case of typhoid fever to every 12,000 or 15,000 people. This is practically elimination and eradication.

Diphtheria antitoxin is so well and favorably known that it hardly requires mention. It prevents and cures this deadly disease.

Scarlet fever vaccine, I believe will soon be as effective as diphtheria antitoxin.

Other vaccines have given most satisfactory results in my hands and in so short a time as three hours I have seen the coughing, sneezing and other symptoms of an acute cold relieved and no return of the symptoms. In fact all vaccines and serums which I have used have given satisfactory results.

The contagious and communicable diseases are the preventable diseases and should be controlled, and it is our duty as medical men and guardians of the public health to do everything possible to control them, and finally eradicate them.

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**Rest in Goitre.**—In simple as well as exophthalmic goitre organotherapy is much more effective when complete mental and physical repose is secured.

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**Cancer.**—Dr. Bainbridge (*Health Culture*) says hereditary and congenital cancer require more study before conclusions can be formed; in the light of present knowledge they hold no special element of alarm.

Contagiousness or infectiousness of cancer is far from proved; the public need have no concern regarding it.

Communication of cancer from man to man is rare, if it really occurs at all; it may be practically disregarded.

In the care of patients with cancer there is slight danger to the attendant.

## VACCINE THERAPY—A CLINICAL STUDY WITH REPORT OF CASES.<sup>1</sup>

BY

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While vaccine therapy has been extensively exploited during the last few months, before various medical societies and to individual members of the medical profession, the subject is still in its infancy; and as to the exact method of action of the various vaccines, we cannot positively say that any theory is correct, but we have some which are very plausible.

My object in presenting this paper is not to suggest any new hypothesis, but to report a limited number of clinical observations upon the use of vaccines. A few remarks regarding the generally accepted theories in simple language may not be out of order.

To Jenner belongs the honor of discovering the efficiency of vaccine. And while he probably did more for the benefit of the human race than any other man prior to his time, it depended upon Sir A. E. Wright, of England, to enlarge upon and develop along other channels the discovery accidentally made by Jenner.

As to the method of action or the change which takes place in the animal economy upon introduction of a foreign protein, there is much controversy. The side-chain theory of Ehrlich is accepted by many and may be correct. That of Vaughan appeals to me personally, and if in this paper Vaughan is quoted rather freely, it is because his conclusions are along the same lines as my own. I am also indebted to

Dr. John Louis Marchand for valuable assistance.

Vaughan's theory in brief is that the animal cell is capable of secreting a ferment which under normal conditions will absorb from the blood current such elements as may be needed, and digest and assimilate them; and that the same ferment will take care of any disintegrated cell tissue. All life is composed of cells of protein matter, and each cell has its own ferment by which it nourishes itself—in the case of an animal, from the blood. These normal cells are capable of digesting many kinds of substances which may gain access to the tissues through the circulation. They will take care of dead tissue; foreign protein introduced may stimulate certain cells to form a ferment which will digest that particular protein but no other; and in that case the animal is said to be sensitized to that particular protein. These are termed the specific proteolytic ferments.

Bacteria consists of living protein matter as complex as the animal cells, and whether living or dead are followed by the same phenomena as any other protein, modified somewhat in the case of living protein when introduced into the animal tissues. The living bacteria are more resistant to the action of the cell ferment, and in the case of aggressive bacteria play an important part in any infection. Certain bacteria show an affinity for different parts of the human body and localize there. Antiferments are secreted by the cells of the animal body and destroy protein bacteria which gain entrance to the tissues, thus acting as a guard to the animal cell. These ferments are known as antigens, antitoxins, antiferments, opsonins, etc.

Each pathogenic bacterium has an individuality of its own; some multiply more

<sup>1</sup> Read before the West End Medical Society, of Louisville, Kentucky.

than others, some are more resistent to the action of the cell ferments; and all invasions of mixed infection do not subside under the administration of mixed infection vaccine. This is probably due to a number of causes, such as the virulence of the germ, tolerance of the body cells, lack of action in the cell secreting its ferment, etc.

In the normal state of the animal body there is a condition termed tolerance. The normal tissue cells can take care of an invasion of foreign protein within certain limits, but if the foreign protein be sufficient to overcome this tolerance, then sensitization may be produced by the injection of the vaccine causing the loss of the tolerance. Each protein germ has its specific sensitizer, and in no instance will a specific sensitizer affect a germ not of that species. Tolerance is non-specific in its action, whereas sensitization is specific as to the foreign protein.

The foregoing gives a fair though limited idea of the action of vaccines. When killed bacteria are injected into an animal, there is produced an active immunity by causing the body cells to secrete a ferment opposed to the specific invasion.

I shall not attempt to consider Wright's opsonic index theory as few of us are likely to make that test, and will generally depend upon the clinical picture as to the indications for vaccine treatment. It is obvious that vaccines are especially adapted to that class of cases where there is localized infection, or where the infection can be traced to a localized invasion primarily, and they should be administered as early in the attack as possible, although I have had excellent results in infections of several years' duration.

I believe autogenous vaccines are superior

to stock vaccines, and the former should be used wherever they can be procured. However, in any case where the vaccine treatment is indicated, instead of waiting for autogenous vaccine to be prepared I would use stock vaccine containing the germ against which I wished to sensitize, and change to the autogenous as early as possible. In many cases the stock vaccines act wonderfully well.

I will now relate a few of the cases I have treated with vaccines during the last few months:

*Case 1.* S. B. P., female, aged twenty-one; date of observation December 7th, 1914. The patient has not been free from discharging tubercular glands about the neck for eight years. She called me to treat her for a distressing cystitis, and said that she had suffered with the suppurating glands so long that it was not worth while to attempt to get rid of that trouble. I persuaded her to allow me to have an autogenous vaccine prepared. I gave her seven injections, beginning with 200 million dead germs, and increasing the quantity until the last few doses contained 500 million. The injections were given at intervals of five days. The two abscesses that were discharging at the time entirely healed, and other glands which were swollen and threatening to suppurate subsided at least a week before the last dose of vaccine was given. There has been no indication of a return of the lesions. It was also an agreeable surprise to note that the cystitis improved to such an extent that I dismissed the patient, although there was still some local cystic irritation.

I saw this woman April 9th, 1915, and upon inquiry learned that she still had more or less vesical irritation. I advised her to send me a specimen of her urine, which was found loaded with colon bacilli, also some streptococci and staphylococci. I had a vaccine prepared from the urine and have administered four doses in gradually increasing amounts at five day intervals. She says she has almost complete relief, and I believe two or three additional doses will complete the cure.

The reason why the first treatment did

not produce a cure was because in the discharge from the tubercular glands I could not procure all the protein bacteria necessary to sensitize the body cells for the bladder trouble.

In making these injections the first was followed by some little reaction and systemic disturbance. There occurred a slight rise in temperature with a feeling of general malaise, and there was considerable pain and discomfort at the site of injection which persisted for a day or two. This, as well as the systemic disturbance, was less after each injection, until at the third or fourth there was nothing more than a little soreness at the site of puncture. A favorite location to make the injection is below the scapula, but it may be made at any point where there is loose cellular tissue beneath the skin.

*Case 2.* Mrs. J. M. H., aged fifty; previous health good, excepting chronic bronchitis following pertussis two years ago. On January 15th, 1915, she took to her bed after a prodromic period of ill-feeling for a week. The clinical symptoms present on the date mentioned were as follows: At ten A. M. a chill, followed by temperature of 103° F., then a sweating period; frequent and painful micturition; pain in the back over region of right kidney. Treatment—salines, urinary antiseptics and sedatives. Quinine was given until the patient was thoroughly cinchonized. Hot packs over kidney. At this time a superficial examination of the urine showed absence of albumen and sugar, specific gravity normal. This condition continued for about four days—a chill, fever and sweat—with no improvement. The fifth day she had two chills and the temperature rose to 104° F. Dr. H. H. Grant was then called in consultation and made the diagnosis of abscess of the kidney, which was corroborated by thorough urinalysis.

I began the vaccine treatment at once with a mixed infection stock vaccine, at the same time ordered an autogenous made from the urine. There was very little reaction following the injection of stock vaccine. I gave her a dose daily for three days; by the third day the chills had ceased and the fever abated. The bladder irritation had subsided under the influence of urinary antiseptics and sedatives before

giving the first dose of vaccine. Four days after the first dose of stock vaccine I gave 400 million bacteria of the autogenous culture. There was a slight chill and rise in temperature following this dose. Temperature of 102° F. lasted about four hours and the injection site was quite painful for thirty-six hours. In four days 500 million bacteria were injected. The patient's temperature was normal at this time, and there was general improvement all along the lines. There were no systemic symptoms following the second administration, but some local pain and soreness persisted for a few hours.

The following four doses were given at five day intervals with no general disturbance and little local discomfort. The urine became normal after the third injection, and the patient made an uninterrupted recovery.

She was so impressed with the action of the vaccine that she requested a culture be made from the sputum in the hope of getting rid of the bronchial affection which had annoyed her for so long. She has been given two doses of autogenous vaccine thus prepared, and will receive another tomorrow. She has greatly improved, the cough is less annoying, there is little sputum, and she is very enthusiastic over her condition. It is too early to predict whether she will entirely recover from this old catarrhal affection, but the prospects are very encouraging. She has gained ten pounds in weight and looks much better.

*Case 3.* Mrs. W. R., aged forty-two, a well nourished housewife to whom I was called March 1st, 1915. She complained of chilly sensations, temperature 99½ degrees F., pulse 84. There was a pimple on the side of her nose, with a little swelling and redness of that organ. Diagnosis of facial erysipelas was made at the first visit. She was given a saline, and unguentum zinc oxide ordered for local application. Gave tinctura ferri muriatis ounce one, glycerinum ounces two, teaspoonful doses every four hours. Ordered vaccine and in the afternoon of the same day administered 750,000,000 combined bacteria. There was no local reaction. The following day the temperature was 103 degrees F., the face very much swollen, the eyes appearing as slits, patient in an extremely uncomfortable

condition. Gave another dose of the vaccine. March 3rd temperature 101 degrees F., swelling had extended around both sides and involved both ears, two or three large blebs size of quarter on each cheek. The swelling was subsiding from forehead and eyes. Gave another injection of the vaccine. March 4th, temperature normal; local condition improving; facial swelling subsiding; no further involvement. Gave no vaccine this day. March 5th, still improving, temperature normal. Gave another dose of vaccine. Improvement thereafter was rapid; dismissed the patient March 8th.

Considering the virulence of this attack, the apparent benefit from almost the first day and her rapid recovery, is convincing as to the efficiency of the vaccine. Under the old medicinal methods of treatment I am certain this woman would have been very ill for two or three weeks. Four doses of the combined vaccine were administered.

*Case 4.* Mrs. R. G., aged thirty-six, rather thin in flesh, and sallow color. I was first called March 31st, 1915, and found the patient in bed with a temperature of 99½ degrees F., pulse 84; otherwise no objective symptoms. She complained of an uneasy feeling over the left kidney with pain on pressure. The urine was high-colored and scanty with frequent and painful micturition. This predominant symptom was the reason she sought medical aid. Prescribed urinary antiseptics and sedatives; secured specimen of her urine and had urinalysis made the same day. This showed evidence of kidney infection with strong indications of stone in the renal pelvis. Had autogenous vaccine prepared from the urine; April 5th she was able to be about the house and appeared better. Relief had been obtained from the vesical irritation, but there was still an uneasy feeling in the bladder with pain in the back. I gave her the first injection of autogenous vaccine on that date, and at five day intervals until five doses had been given. After the second injection she was free from all pain and discomfort; after the fourth the urine became normal, and at my last visit May 1st, she was apparently well. Her color has improved and she looks healthier in every way. She had the usual reactions from the first injections, but nothing of consequence. It remains to be seen whether the cure is permanent.

*Case 5.* M. K., male, white, aged fifty-six. This was a case of post-operative, supposed malignant disease in which there has been no improvement either from the stock or autogenous vaccines. The patient was operated upon in December, 1914, and a growth involving the ileocecal valve was removed, together with about eight inches of the ascending colon and four inches of the ileum, the ileum being then anastomosed into the side of the transverse colon. He did fairly well for about five weeks, was able to walk about the house after leaving the hospital; then a fistula developed through the incision, and a large ischio-rectal abscess has recently formed. No evidence of malignancy was found in the neoplasm removed, and it appeared to be of inflammatory character. Later microscopical examination shows streptococci, staphylococci and colon bacilli in the discharges from the fistula. The sputum contains streptococci and staphylococci. The blood shows a mild grade of anemia. His temperature for eight weeks has ranged from 102 degrees to 105 degrees F. Widal test negative; appetite fairly good. He is greatly emaciated and looks to be at death's door. The muscles are rigid and the tongue so stiff and dry that it can scarcely be protruded. The patient is so weak that he can barely utter an audible sound, yet he still lives.

I have run the gamut of vaccines in this case—the mixed stock, the colon, and the autogenous—without the slightest effect and without any reaction. In my opinion the tissue cells in this case are beyond sensitizing, or the disease producing the disability is of a malignantly fatal character that would prevent any tissue sensitizing from overcoming its effect. Did I not think it would be useless, because of his nearness to dissolution, I would try some of the phylacogens that would supply their own antibody, but I doubt if he lives a week and the case is surely hopeless.

The cases noted are among some of the latest I have treated with vaccines, and in the great majority improvement has occurred. I have used the vaccines in a number of others with similar results, and to report them would be tiresome as the outcome has invariably been the same.

As already stated, personally, I prefer the autogenous, if it can be procured, to the

stock vaccine; but I do not hesitate to use the ready made article until the autogenous can be prepared.

## INTERNAL HEMORRHOIDS.

BY

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Every little while a patient suffering with hemorrhoids comes to me saying his doctor sent him to be operated upon. Sometimes I find these are not operative cases and that is my reason for presenting this subject at this time. I shall try to show when we should and when we should not operate upon hemorrhoids. It is not so material how one operates as to know in what class of cases to operate and why the wound may be slow to heal or why the hemorrhoid recurs.

Internal hemorrhoids are varicosities of the middle or superior hemorrhoidal vessels and arise entirely within the anus. They begin at the points of anastomosis between the portal and caval systems. These anastomoses are very numerous. The most common origin is at the level of the valves of Morgagni about one-half inch above the anal orifice and from here they gradually extend up to the larger trunks and plexuses. Even normal veins are somewhat enlarged in this situation and are called glomeruli.

Hemorrhoids may be found at any age of life. They are uncommon in children but several good authorities have reported cases. Trunka (Tuttle, p. 583) reported 39 children under 15 years of age of whom five were under one year old. Young adult and middle life is the most frequent age because such factors as environment, habits and constitutional peculiarity are most active then. In advanced life the absorption of the peri-

rectal fatty tissues, the relaxed muscular tone, constipation and sclerotic changes in the liver and blood vessels contribute to produce hemorrhoids but we also find hemorrhoids frequently in the nervous, anemic individuals because of nerve and muscle exhaustion which causes circulatory relaxation and dilation. For this reason melancholic, choleraic, sallow individuals who suffer from liver disturbance are prone to hemorrhoids. In women at the menopause we occasionally have a hemorrhage from these vessels which is a sort of vicarious menstruation.

The text-books divide hemorrhoids into arterial and venous. This is, however, not a distinction of kind or variety because the two conditions are not similar in any sense. The capillary hemorrhoid is a small tumor, rarely larger than the end of the little finger and sometimes as small as a pin head. It is an arterial nevus, spongy in texture and resembles a strawberry in appearance. Early in their existence they have a granular surface covered with a very thin wall and are very liable to bleed. Later plastic exudate and thickened areolar tissue covers the vessel and hemorrhage is less liable. The gentlest examination or even the passage of the bowel movement is sufficient to start the hemorrhage. I recall a case which bled profusely and on examination the pile was found no larger than the head of a black pin. Excessive hemorrhage, particularly if spurting in character is pathognomonic of the capillary hemorrhoid. Frequently large amounts of blood are lost and a number of deaths have been recorded from this cause. Of course a large capillary or arteriole is necessarily involved in such a case. This tendency to great loss of blood makes the capillary hemorrhoid much more dangerous to the patient than the

venous variety. In the palliative treatment this distinction is imperative because the patient may be exsanguinated while the physician is temporizing with injections or styptics. The capillary variety do not protrude or cause any of the pain or discomfort attendant upon the venous variety. Hemorrhage itself is the cardinal symptom and requires energetic or even heroic treatment.

The venous hemorrhoid is more common than the arterial. It may appear as quite a tumor frequently one-half to one inch across its base with a mucous membrane covering which is livid bluish and glistens. Matthews reports seeing one as large as a small orange. The venous hemorrhoid is situated in the submucous connective tissue and is composed of a dilated and varicosed vein with its capillaries and also the arterial capillary supply. These tumors are not purely venous. Sometimes several small veins may be twisted together into one mass. The sacculation and varicosities are limited to the venous vessels and do not affect the arteries. Around this mass of veins is a fibrous capsule which sends trabeculae (partitions) in between the veins. The mucous membrane covering the pile is chronically inflamed. Early the walls of the veins are thickened by this inflammatory hypertrophy, but later they are extremely thin with nothing but an endothelial covering. Sometimes such vessels may form large venous pockets.

Internal hemorrhoids are brought on by anything that increases the local blood pressure. Man is the only animal that assumes an erect posture most of his waking hours. In this position of course a heavy column of blood must be lifted through these veins continuously for many hours. All during our active life there is this predisposition to hemorrhoids which needs but some little

local congestion or inflammation to develop the varicosities. For this reason proctitis is a very common cause of hemorrhoids. Early in my work I noticed this association of hemorrhoids with proctitis. The acute catarrhal proctitis is often met with and in every case you will find an edematous mucous membrane with the hemorrhoidal vessels engorged. As the proctitis subsides the hemorrhoidal edema and engorgement also reduce and finally disappear. If, however, the proctitis persists as a subacute or chronic form the hemorrhoids also continue and a gradual hypertrophy of the mucous membrane occurs. This increases the bulk and weight of the mucosa which separates and slides down on the areolar tissue until it is grasped in the sphincter. The spaces of the submucosa about the hemorrhoid are filled with connective tissue. Later when the proctitis reaches the atrophic stage the hemorrhoids remain because of this connective tissue infiltration which permanently constricts the venous outflow. Now begins a second factor. The descending fecal mass acting in the reverse direction on the veins distorts them further and tears more mucosa from the muscular wall. With each bowel movement the hemorrhoidal mass acts as an obstruction and the feces are forced through. This increased muscular action drags down the hemorrhoid and the adjoining mucous membrane until they prolapse, thereby increasing the size of the hemorrhoid itself. Finally when they have attained considerable size they prolapse easily and act as foreign bodies tending to excite the sphincter.

Hemorrhoids brought on in this manner are the result of digestive disturbances, the improperly digested or fermenting bolus acting as an irritant. In this way constipation is a frequent cause and the vein rup-

tures by the engorgement and stretching due to the passage of the feces and not to any traumatism. In this same way drugs used to relieve the constipation also frequently congest the rectal circulation, i. e., aloes, senna, calomel and gamboge. Warm enemas also act in this manner. Certain articles of food by irritating the mucous membrane cause increased peristalsis or tenesmus and may provoke hemorrhoids. Spices, peppers, mustard, sauces, radishes, watercress, tamales, chili con carni and pickles, also alcoholics and tea. An excess of carbohydrate diet which cannot be cared for by the liver blocks the portal circulation and later the hemorrhoidal vein. These dietetic changes account for the apparent influence of the seasons upon the hemorrhoidal circulation. As the warm spring weather comes the system cannot handle the same amount of hydrocarbons it has been accustomed to consume during the winter and the blood is thrown on the portal circulation. There are many other conditions which cause straining or bearing down by the patient and thus congest the pelvic venous current, particularly chronic constipation, stricture of the rectum or urethra, stone in the bladder or an enlarged prostate. The pregnant uterus or myoma of that organ, pelvic exudates, adhesions or even a retroverted uterus. It is well to bear each of these conditions in mind because a patient may consult you when suffering with one of these conditions and also complain of hemorrhoids. The hemorrhoids, however, do not require treatment directly but are wholly dependent upon the underlying condition. In this same manner all those occupations that increase the abdominal or pelvic pressure will induce hemorrhoids as severe muscular exertion, prolonged standing or sitting still, especially if on a

vibrating platform as with railway men or teamsters. Desk workers also are frequently sufferers from sitting in a bent over position which crowds the abdominal contents toward the rectum.

There is one other class of positive causes of hemorrhoids in diseases of the heart, liver, pancreas or kidneys and occasionally tuberculosis or syphilis. Since the exciting cause in this class of cases cannot be removed there is no hope of curing the hemorrhoids and tentative treatment is all that should be attempted.

**SYMPTOMS.**—Hemorrhoids sometimes exist for years without causing any symptoms whatever, and again, they may be troublesome from the beginning. When they become inflamed or ulcerated, they cause great pain and distress. They probably set up more reflex nervous symptoms than any other disease. They may remain quiet for a long time and then without any apparent cause become inflamed. When they are of large size, they produce a sensation of fullness or distension of the rectum, as if some foreign substance were present. During defecation the tumor is forced within the grasp of the sphincter and tenesmus is set up, with also a feeling of nausea and sickness. Sometimes the tenesmus is agonizing and its daily repetition exhausts the patient. After each bowel movement he must replace the hemorrhoid and in doing so is likely to induce a spasm of the sphincter. If the hemorrhoid is allowed to remain within the grasp of the sphincter it becomes strangulated and finally gangrene develops and the hemorrhoid sloughs off. Thus nature attempts to cure the trouble. Sometimes the slough or the surface beneath it becomes infected and pyemia with perhaps a fatal result is the termination, or an abscess develops and a fistula is the sequela.

If strangulation and sloughing do not occur, the sphincter gradually relaxes and the piles are forced out with coughing, sneezing or stooping or even by walking or standing and the piles remain out altogether. An acrid, irritating mucus discharges from the anus due to the chronic proctitis and keeps the perineum moist and often excoriated, thus favoring the growth of warty excrescences. This condition occurs most frequently in the aged and here sometimes the discharge may saturate the clothing and the anal sphincter is very much relaxed, thus allowing an almost constant prolapse. Of course inflammation and thrombosis with suppuration may occur without strangulation. Talka found ulceration or fistula in nearly one-half of his cases of hemorrhoids. If the hemorrhoids remain prolapsed for any time the surrounding anal wall becomes inflamed and edematous, and this swelling further interferes with reducing the piles.

Bleeding in some degree is a symptom of all internal hemorrhoids. It may be slight, a mere streaking of the passages or profuse enough to cause fainting. Frequently hemorrhage follows each movement of the bowels for a while and then ceases for several days or weeks only to recur again about the time the patient thinks he is cured. This constant loss of blood produces an anemia very suggestive of malignant disease. Prolapse of the tumor always favors bleeding. In women, a hemorrhagic flux sometimes replaces menstruation and in apoplectic subjects or those with atheroma this periodic loss of blood lessens the tension of the blood vessels and diminishes the tendency to rupture of the cerebral vessels. In such cases the prudent surgeon hesitates before removing the outlet.

Hemorrhoids of any variety are prone to

exacerbations of inflammation followed by periods of rest. During the inflammation, they are very liable to ulcerate, slough, or develop abscesses beneath them. When the tumor is swollen or strangulated, and actively inflamed, the sphincter alternately contracts and relaxes, causing excruciating pain which lasts until the hemorrhoid sloughs off, is operated upon, or is relieved by local remedies. In old cases, the hemorrhoidal wall becomes tough and hypertrophied.

**Diagnosis.**—The diagnosis of internal hemorrhoids, *per se*, is quite easy, but the differentiation of the variety is much more difficult. Hemorrhage is the chief symptom and may be either venous or arterial in both varieties. The patient's description is something like this: during defecation and perhaps before the bowels have completely moved a more or less severe hemorrhage occurred which lasted for some time after he had finished his toilet. The blood came in spurts and was bright red, a dizzy feeling came on and he became pallid and clammy. There was little or no pain and no protrusion. With such a history the rectum should be thoroughly examined in a good light and with a speculum. The hemorrhoid may be small and elude digital examination as it is soft and velvety, but with a speculum it can be easily found because the stretching of the bowel in dilating usually starts the hemorrhage afresh, and in a capillary hemorrhoid it bubbles or spurts.

In another case the patient says that after the bowels move he has to retain his seat because the blood continues to drop for several minutes and if in a hurry he goes about with the blood dripping and soiling his clothes. Here the hemorrhage is less severe because the connective tissue growth takes on a plastic infiltration forming a

thick covering which can be torn only by such a considerable force as is only occasionally applied. The rectum feels as though it were only partially emptied and so the individual strains trying to expel something. Usually on palpation he finds the hemorrhoid within the grasp of the sphincters and unless it is replaced the tenesmus continues for hours. This is the venous hemorrhoid.

The capillary hemorrhoid is soft, spongy or granular and easily yields or tears on pressure. Hence hemorrhage results from even a slight injury, and therefore the small capillary hemorrhoid is a source of great danger from the loss of blood, while the large, well formed venous hemorrhoid is not so dangerous. The venous hemorrhoid when of large size will protrude and if the patient suffering with hemorrhoids assures us there is no protrusion, we suspect internal hemorrhoids and probably the capillary variety. Digital examination is unreliable in diagnosing internal hemorrhoids because even good sized tumors cannot be detected after they have been returned within the rectum unless pedunculated. Inspection assists only if they protrude. Let the patient retire to the lavatory and strain a little trying to force out the hemorrhoids. If this fails or is not convenient, dilate the sphincter with a bivalve speculum and the pile will fall in between the blades. If the tumors are low in the rectum they may readily be seen by inserting one blade of a Sims speculum.

Other symptoms of internal hemorrhoids are vague and uncertain as they occur in other rectal troubles and may arise from remote causes. Pain in the thigh or back, sensations of heat or burning in the rectum and frequent micturition are all too unreliable to be considered worthy symptoms of

any particular disease. It is well to take into account only such definite indications, as relate directly to the rectum and anus, but these significant tokens should require a thorough examination.

**Treatment.**—From what has been said as to the etiology and symptomatology of hemorrhoids it is evident that the treatment varies with each case. Hemorrhoids that are amenable to treatment occur under very different conditions and in all classes of patients. There are many methods and most of them are good in selected cases. Your treatment is half finished when you select your case, determine its proper treatment and know what results to expect.

The reason you treat so few rectal cases is not that they are infrequent, but rather that your patients do not like to have an operation and particularly to take a general anesthetic and be confined to bed. Patients suffering with piles are prone to make use of domestic remedies and nostrums, until they are physical wrecks from loss of blood and pain. All the time, they refuse to be operated upon. With our present knowledge, it is not always necessary or wise to give a patient a general anesthetic and keep him in bed or in a hospital, three or four weeks, irrespective of the variety or condition of the piles. Practically all uncomplicated cases, and they are numerous, may be operated upon with a local anesthetic at your office or at the patient's home. This eliminates the danger to life from heart, lung or kidney complications of a general anesthetic and lessens the pain and danger of secondary hemorrhage due to vomiting as occurs so often after a general anesthetic. Incidentally it puts dollars cheerfully from the patient's to your pocket. Where the tumors are isolated and prolapsed they may be removed under local anesthesia at the

office. Where they are not prolapsed and where they extend high up in the bowel we find they are usually complicated with a narrow anus and an hypertrophied sphincter. Under such conditions it is difficult to reach the top of the varicosity and as the whole pile must be removed it had best be done under ether in such cases. Of course if all of the pile is not removed your operation is a failure. If several hemorrhoids are to be removed, the operation had better be done at the patient's home even if under local anesthesia, because if performed in your office there is danger of secondary hemorrhage from a stitch pulling loose by the patient's movements on his way home.

Let us divide these venous tumors into

1. Those that are best treated tentatively.
2. Those that may be removed under local anesthesia.
3. Those that require a general anesthetic and confinement to bed with absence from work for some time.

Venous hemorrhoids may be much relieved by palliative treatment where surgical treatment cannot be instituted, either because of the patient's refusal, some jeopardizing systemic condition, or in aged or delicate individuals. In all these conditions unless there is excessive bleeding or strangulation it is better not to operate but to use local tentative measures as there is always danger of embolism, hypostatic pneumonia or phlebitis after operation on such individuals.

If the hemorrhoids are inflamed and prolapsed they must first be reduced. If the patient is seen at home he should be sent to bed. An upturned chair is placed in a slanting position on the bed and the patient on his knees reclined against the chair. This places him in an extreme oblique lateral

position, a posture between the Sims and the knee chest.

Next paint the whole hemorrhoidal mass with 2% cocaine in 1-1000 adrenalin solution and wait twenty minutes because the circulation in this edematous and strangulated mass is slow and the drugs are not rapidly absorbed. Gravity depletes the tissue and the patient's position with the thighs flexed relaxes the pelvic muscles so that the protrusion will either reduce of its own accord or may be easily replaced. Of course all of it does not belong internal. Probably about one-half does and a lateral sulcus running parallel with the median raphe will usually be found. Internal to this line is mucosa and external to it is skin. This should be remembered because if the whose mass is placed within the rectum the patient will be just as uncomfortable as he was before. That part external to the sulcus is edematous external tissue and sometimes it may be necessary to incise this to deplete it quickly.

After the hemorrhoids have been properly replaced the whole anal region should be well covered with hydralstal ointment then covered with a gauze compress and the patient let down on his bed stretched out prone. The pad and buttocks are now strapped down with adhesive plaster reenforced with a T bandage. If the hemorrhoids are inflamed but not strangulated they should have a warm, slightly antiseptic bath, followed by a cold douche and then the hydralstal ointment applied. The patient should lie on his face as long as he can and then may turn on his side with the hips elevated on a pillow or two. Keep the hips up and do not let him lie on his back. This is important because it will arrest inflammation, hasten resolution and relieve pain more effectively than any other remedy.

The next day put the patient on his side with the knees well flexed, dilate the sphincter gradually and massage the hemorrhoidal field. Irrigate the rectum and anal canal with sterile water and swab the piles with 1-1000 adrenalin solution and apply the hydralstal ointment on the outside. If there is much mucous discharge it will be well to inject one-half ounce of aqueous fluid extract of Krameria at night.

The bowels must be kept open each day and it is a study with each patient to find something laxative but not exhausting. Sulphur is gentle in its action, produces a soft mushy stool which easily slips by obstructions and allays inflammation by its presence in the stool. Castor oil also produces a soft stool, does not create gas and leaves the abdomen relaxed. It is a good plan to have the evacuations at night that the patient may rest after cleansing and dressing the rectum.

Hemorrhoidal sufferers should avoid strenuous exercise, bicycling, riding, automobileing and railway journeys as these all maintain a position with the thighs flexed which opens the anus below the internal sphincter, thus losing the anal support. By careful, close attention these patients can usually be made very comfortable, but of course it is only tentative and not curative.

#### **Removal Under Local Anesthesia.—**

The details of technic of removing hemorrhoids under local anesthesia has been presented in another paper and need not be discussed here. One of the cardinal reasons for using a local anesthetic is to interfere as little as possible with the patient's pursuing his regular duties. Therefore too much must not be attempted at one time. Where several hemorrhoids are to be removed it will require several sittings. Only one or two should be removed on one day. A local

anesthetic has a distinct advantage in aged, timid or nervous patients who object to a general anesthetic, but you must attempt only such cases as the tumor can be brought outside or the anus is patent. Internal hemorrhoids, bleeding and painful and demanding operation but not protruding to any extent cannot be satisfactorily removed under a local anesthetic because the very first step in the treatment of such a case is careful, but thorough dilation of the sphincters and that is impossible without a general anesthetic. If the anus is patent or if you can easily reach the upper limit of the base of the pile without much stretching you may operate under cocaine, but if the pile is a large one the patient should rest in bed for a couple of days. The determination of which hemorrhoids shall be operated upon with local and which under general anesthetic is an important matter and in a general way we can say that most cases may be operated upon safely in the physician's office or at the patient's home under local anesthesia, causing but a few hours to two days' detention from business. Where only one or two piles exist the operation may be performed in the office and the patient sent home after a little rest, but in aggravated cases where a large area is involved or where the blood vessels are atheromatous the work should be done at the patient's home or at the hospital to protect against the chance of secondary hemorrhage. With careful treatment you will find that only a small part of your hemorrhoid cases require a general anesthetic.

The important relationship of the other abdominal and pelvic organs to the rectum is always important and it must be remembered that any one may be sufficient to produce the hemorrhoids and if we remove them ever so carefully but fail to remedy

the exciting cause the hemorrhoids are sure to return. The treatment of any other diseased condition bearing on the rectum or obstructing its venous flow is fully as essential as the thorough removal of the hemorrhoidal tumors. I have seen a number of such cases where the hemorrhoids had been removed and new ones developed and where when treatment was directed to the adjacent organs the hemorrhoidal trouble was spontaneously and permanently cured.

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## CONSTIPATION—THE CAUSE OF NEARLY ALL RECTAL DISEASES.

BY

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Constipation is the primary cause of the great majority of rectal troubles and as a result of the prevalence of constipation among our American people, rectal diseases are the most common of our bodily ills—as well as the least understood.

The cause of this universal constipation is the way we live. Sedentary habits, indoor work, improper clothing, alcohol, excessive eating, long standing, desk work, the use of irritant drugs to move the bowels, all act as exciting causes of this almost universal ailment.

The results of constipation are as varied as the cause. From it we have headache, nausea, "the blues," melancholia, auto-intoxication following an absorption of retained waste and toxic material, rectal fissures, painful defecation, rectal fistula, abscess within the rectum, intense itching of pruritus, prolapse of the rectum following the straining of defecation, recto-anal ul-

ceration—a condition responsible probably for more rectal suffering than any one disordered state, polyp formations from the rectal mucous membrane, malignant formations perhaps—all serious rectal conditions, many of them resisting treatment for a long time through neglect in their proper diagnosis, and developing primarily from that arch enemy of our present social life—constipation.

It is to be regretted that until recently, little if any attention has been paid to rectal diseases. I cannot recall a medical college that has a special course in that branch of medical practice, other than the post graduate institutions where its need is realized. There are but few general practitioners who care to treat rectal cases and the proctoscope, or any other rectal instrument is a rarity indeed in the office equipment of the average physician—and yet, rectal diseases are very common and every patient presenting any of the numerous symptoms of rectal origin should be given a rectal examination instead of a routine laxative prescription, with the hope of overcoming by random treatment what has not been sought out by a proper examination.

Both the physician and the patient are to blame. Often there exists a reluctance to expose the rectum to examination. At other times painful fissures or a hypersensitivity locally makes the examination protested by the patient and omitted by the physician—with the result that a proper comprehension of the real condition is not obtained and relief becomes impossible without proper diagnosis. Patients have suffered for long years with the intense itching of pruritus—using lotions and ointments needlessly, uselessly—when relief only could have been obtained by eliminating the discharge from a fistula that produced a

chronic inflammation of the skin about the rectum—and an itching—almost unbearable.

Victims of inoperable cancer often apply for treatment in the dispensary and in private practice seeking relief for an alternating diarrhea and constipation, little suspecting the nature of their rectal ailment but have gone from doctor to doctor—purged by each but not examined until the tell-tale signs of emaciation and hemorrhage—contribute to the last sad picture of a helpless victim—his rectal condition not discovered until relief also is impossible.

The most frequent condition met in the rectal examination of patients presenting themselves for office treatment is recto-anal ulceration, an inflammation of the lining membrane between the anus and internal sphincter of the rectum. Its presence is responsible for a multitude of rectal symptoms—out of all proportion to the lesion. It is responsible for the intense itching of pruritus, fissure with its pain and discharge, abscesses within the rectum by absorption of the discharge from the ulcer, fistulous openings upon the skin and within the rectum, polyps—and probably an eventual malignant formation.

Recto-anal ulceration is a frequent pathological state because of the scant blood supply of the affected part, because of the ever changing dimensions of the site, and because the fecal contents that pass over the ulcerated area tend to prevent healing.

The necessity for a proper rectal examination is the one essential feature. Treatment becomes a routine procedure after the examination—for after the existing condition is determined, its relief is usually effected by simple and ordinary methods.

## THE SHIP SURGEON.

BY

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On several occasions I have been asked to record some of my experiences as a ship surgeon. Having served in this capacity before and during the present war on different liners, and having covered a large area of this globe, I am in a position no doubt to give some interesting side lights on this phase of medical and surgical practice. I am especially desirous of pointing out certain facts concerning this work with the object of correcting certain impressions and if not able to change them entirely, at least to bring about an improvement in the present condition.

The following are to be taken into consideration in studying the ship surgeon and his work:

- 1st. His status on board and in the medical profession;
- 2nd. The conditions under which he has to perform his duties;
- 3rd. The changes to be advocated by the medical profession in order to better the ship surgeon's position and increase the respect in which he is held.

In discussing these details I have due regard for the old axiom: "The exception proves the rule." If I should during the following remarks unintentionally hurt the feelings of some ship doctor or steamship company, each, I hope, will at once be satisfied with my explanation that no reflection is intended, and so far as I know their cases are the exceptions. Whatever I have to say then, however severe, I trust will be taken in the spirit in which it is written, since my purpose is to benefit ship doctors and steamship companies alike.

Generally speaking, to use a common American term, the average ship doctor is "no good." By ship owners, passengers, officers and crew alike he is looked upon as a necessary evil. Especially the steamship company looks upon him so. The law compels them to employ a doctor on board if the vessel carries over a certain number of passengers and crew. This being an extra expense to them, the companies as a rule try to obtain the services of a doctor at the

- 2nd. The doctor who just makes one trip (vacation, etc.), for the sake of recreation;
- 3rd. The medical man who can find no position and who has not sufficient means to start a practice; and last but not least
- 4th. The doctor who either through misconduct, drug or drink habit, or general disability has proven himself unworthy of medical confidence—in short a derelict of the medical profession.

*(Photo by Mr. Gregory Mason.)*

FIG. I. Armenians on board S. S. Kurek going to join the army.

lowest possible cost. As long as he is a qualified man, whether or not he has anything to recommend him as a proved skilled physician and surgeon (so necessary on board a ship as I will point out later), he is accepted—because the law has been satisfied. The average salary being from fifty to seventy-five dollars a month (exclusive of "board and lodgings"), the doctor that accepts such position usually falls within some one of the following classes:

- 1st. The young, recent graduate who goes for experience sake; or

As a rule, it is a member of the latter class we meet with on ocean-going steamers and it is this particular type I have chiefly in mind when I refer to the ship surgeon, although I shall also have something to say about the others.

It is the derelict, however, who is mainly responsible for the ship doctor's bad reputation. Is it really a wonder that passengers and crew are suspicious of his professional knowledge when it is a fact that many such doctors are employed on board ships? And yet this is very hard on the serious, con-

scientious men so employed. The latter will try to show with all possible speed that he is not of this class and does not wish to be so considered, but all too often, he is looked on with suspicion. When the first injustice to the conscientious doctor has been repaired, and the patient acknowledges the doctor's good and faithful treatment as a result of careful diagnosis, then, of course, there is nothing but praise, often bordering on glorification, and the usual exclamations

himself as it was the respect one felt for the medical profession. On board ship none of this is evident; and this brings me to point two, the condition under which the ship doctor has to perform his duties.

As remarked before, some think that the ship surgeon is a necessary evil. Although reckoned amongst the senior officers of the ship, his cabin as a rule, excepting on the more up-to-date liners, is small, inconvenient and not suitable for a physician's

(Photo by Mr. Gregory Mason.)

FIG. II. Off to the front.

of: "Ah, but he is a good doctor; I wish he was my physician; he is not at all like other ship doctors, etc., etc.," are not missing. In my opinion this very praise hurts more than the previous accusation of being "no good." Instead of the patient assuming that the physician is good, professionally speaking, because of his calling, he must first prove that he is such. This hurts professional dignity, as every one will readily admit. In days gone by there used to be a certain respect, a feeling of relief and confidence when the doctor entered the sickroom. This was not so much for the physician

quarters. This no doubt is the direct result of the idea that the doctor is of little or no importance. And yet, next to those charged with the navigation of the ship, he is most able to safeguard the interests of the company. Indeed, he is often all important, inasmuch as he decides whether a member of the crew is sick and whether he is able or unable to work. Through incompetence or malice he could lay up part or even the whole crew, and in this way seriously retard the movement of the vessel; it is on his decision that a person is pronounced dead, and buried at sea, and no

one, not even the master of the vessel can question his authority; it is he who signs and swears to the documents stating that no epidemic, infectious or contagious disease has occurred nor any insane person is on board on arrival in port. The captain, as the master of the vessel, and the company as the owners thereof, are fined heavily for knowingly bringing such cases into port, and many times, to my own personal knowledge, a company has been fined one thousand dollars, or more, and besides has had to pay

Buenos Ayres, I was requested by the company's agent to assist a doctor of another vessel of the same line just arrived there from England on her way to New York, in the examination of the steerage passengers. By way of explanation the agent said something like this: "This doctor has not had the experience with trachoma you have, and we would be thankful if you will assist him and point out to him the United States rules in regard to this and other infectious diseases barring entrance."

FIG. III. The Russian American liner S. S. Kursk—14,000 tons.  
Capt. A. Kirschfeld, Commander.

the additional expense of caring for or returning the rejected person to the original port, all through the neglect of the ship doctor, who could have prevented this, had he been a proficient man and not a derelict of the "I do not care" kind. It is not out of place here, to relate to you, by way of example, my own experience in a case of this kind, and I daresay there are several such cases.

During my work on board a liner as a surgeon and while in port in the harbor of

On my arrival at the examination office I found there, to be exact, a short, old (between sixty and seventy years of age), miserable, ill-looking, shabbily dressed individual, who after I had introduced myself, told me that he was Dr. D—, of the S. S. V—, and in further introducing himself said that he had been in practice in Edinburgh, had lately given over his business to his son, and had made this trip to see something of South and North America. I felt rather a little upset to think that this was

one of my professional confreres, and in trying to forget this I explained my mission to him. He listened to what I had to say, but then suddenly turned squarely on me and answered me somewhat as follows:

"You will please tell the agents that I do not know trachoma and what is more I do not wish to know it. If the company is in danger of being fined, as you say, on account of bringing in passengers suffering from trachoma or any other ailment, that is not my business. I suppose they know very well what to do in a case like that. I am not the one who has to pay it. I am only engaged on board this vessel during the voyage from England to the United States, and receive in New York my salary and a first class ticket to Scotland. That is all; thank you for calling, good day."

Although I felt hurt, later I could not help admiring the old man for his candid statement. Unconsciously he treated the steamship company in the way most of them treat their doctors. In reality he said: "You do not appreciate thorough medical work, so I have no regard for your suffering as a consequence of a lack of it. The relation is reciprocal."

As I stated before, however, the steamship surgeon can be a power for good to the ship company. If he is what he ought to be, a good and above all a keen and accurate diagnostician, he will be able to tell at once in cases where the crew is concerned, whether a man is sick or is a malingerer, whether after the treatment for a minor injury, bruise or ailment, the subsequent pain is exaggerated or true, whether the sufferer may resume his duties, should be laid up, or a lighter work be asked for him during the healing period. All this a successful surgeon must be able to handle. Not only must he be a man of broad ex-

perience, but he should have a good knowledge of human nature, especially of the type of seafaring men, among whom malingering is a daily occurrence. The weak, inefficient doctor soon becomes the dupe of this class and the steamship company loses time and money through the insufficient working power of the crew. If the steamship company expects to get good service from their doctors, then they must employ capable doctors, and these can only be had for an adequate salary. In the end the steamship companies are found to be the chief beneficiaries—if they only would appreciate the fact.

The passengers will also be much better protected. The capable ship surgeon for instance will never lose sight of the fact that . . . . "not everyone who vomits is seasick." When this fatal mistake is made—as it has been so many times—there is no other doctor to rectify it, before it is too late! It may be a case of life and death, and no doubt there are many cases where fatal results have been directly due to wrong diagnoses. There is no coroner to demand—and order—an autopsy. The decision of the ship surgeon is the last word. You can not attack him for neglect or inefficiency, his version of the case is perforce, "the truth, the whole truth and nothing but the truth."

Is it any wonder I ask, "should a derelict hold so important a position?" Should not the ship surgeon be above all, a physician who is a credit and not disgrace to his chosen profession? Should the saying: "Oh, he is only a ship doctor," ever be warranted? He cannot, in case of doubt, send for and consult a brother doctor; he cannot send to the hospital and transfer the responsibility of his case. He cannot limit himself to general practice and it is often

demanded that he be familiar with all the special diseases, as well as a keen and able surgeon. In other words, he must be an expert all-round medical man, and possess ingenuity to treat any and all cases, no matter how difficult or what the circumstances. The ship surgeon has not a qualified staff to assist him, and it is only in rare instances that there is any one who can be trusted even with the giving of anesthetics. The ship surgeon must be doctor, assistant and nurse if he wants to do good work and get satisfactory results.

That no more complaints of inefficiency of the ship doctor leak out and become public is largely due to the doctor's good luck and the oxygen and healthful surroundings in general while at sea, which no doubt have helped in many instances to counteract the harm or mitigate the results from indifferent or wrong treatment.

The proficient ship doctor will never be blind to the great responsibility he undertakes when entering upon his work. He will realize and constantly bear in mind that passengers do not call him in as a matter of choice but primarily because they have no alternative. He at once takes the intimate place of the family physician, and this often puts a patient, especially if a woman, in a very embarrassing position. Personally speaking, I have always felt their diffidence keenly, and for this reason have never gone alone into a cabin occupied by a lady passenger who needed my services. Out of consideration for her natural delicacy of feeling I always insist on the company of a stewardess, or in some cases when conditions warrant, it is better to have the presence of the patient's husband or some near female relative. The conscientious physician fully appreciating the position the patient is placed in, will through good taste

and professional tact soon win her confidence and allay her fears. The doctor who thus regards the little things and necessities of his calling, not only upholds the honor of the medical profession, but is a power for good to the company he serves. Thus he advertises the ship, the line, and the company, for passengers do not fail to report the care and treatment they receive from the ship doctor.

On the other hand the direct result of inefficiency of the ship doctor is disrespect from captain, officers and even down to members of the crew. Nor can they be blamed under the present circumstances. Once having had an incapable man on board, they naturally take it for granted that every doctor is the same. Most captains and chief officers have had more or less practical experience on board smaller vessels where no doctor is regularly employed, and have received instruction in first aid to the injured. It is a fact that in some instances these men have shown the derelict ship doctor that they knew better what to do in an emergency than he did, and to their credit it must be said that without training and with only a limited amount of appliances at their command they often do wonderfully well. And yet though of great benefit to some of them, this little knowledge is often fraught with danger as these novices readily believe they know all that a surgeon does, and think they have a right to question or criticise his work. Had steamship companies from the start employed responsible medical officers and instructed their captains that the doctor stands alone at the head of the medical department—that he must not be interfered with in any way—the ship surgeon's authority would be established and there would be more respect shown to him by all concerned. These and

others too numerous to relate here, are some of the conditions under which the ship doctor—however capable and conscientious he may be—has to perform his duties.

And now what shall we do to remedy existing conditions? In my opinion the very first step to be taken is for the steamship doctors to organize, the organization to be under the leadership of medical men of repute and standing in the medical fraternity; this organization to act in a way as a clearing house for ship doctors, to which companies can apply for a medical man, and get in addition to the man, some guaranty that he is suited in all respects to undertake this responsible position. If the steamship companies will cooperate with the organization, will pay salaries required to get high grade men, it will not be difficult to get rid of the incompetent—to eliminate the derelict—and make the position of ship surgeon as creditable and honorable as any physicians can hold.

This proposed organization should have a reasonable fee for membership and some arrangement whereby the steamship companies and the doctors obtaining appointments would each pay a nominal sum. Thus could be developed an income sufficient to maintain a headquarters—say in New York City—with an executive clerk in charge to keep records, to maintain a register of applicants with their credentials, to handle applications from the steamship companies, to collect all funds, and in every way to make the organization a practical, helpful and efficient association. These headquarters, in other words, should be a sort of clearing house for competent ship surgeons. By restricting membership to only those who could present dependable evidence as to personal and professional qualifications, there would never be any

question as to the competency of the members. Indeed, membership in this association, as I conceive of it, would be a testimonial to a medical man's ability to serve as a ship surgeon.

The headquarters could serve as a meeting place for ship surgeons whenever their ships come to New York, and by establishing the rule that each member send a post card or brief note from every port touched at, the headquarters could keep in touch with its members at all times and by maintaining a large bulletin board on which the reports from its members could be posted, a community of interest would be established that could not help but bring the members closer together.

In time a similar headquarters could be opened in London or some other great port of the world, and the increased membership would make possible its being properly financed. Reports exchanged weekly between the two headquarters would serve still further to keep the members in touch with each other. The whole direction of the organization should be in the hands of a president, vice-president, secretary and a small board of directors. To these the executive clerk at each headquarters should be responsible, although given ample freedom of action to insure the greatest possible efficiency in serving the immediate interest of individual members.

It is undoubtedly true that the principal difficulty in the way of the plan I have outlined is the problem of the initial financing. Surely there are few ship surgeons with sufficient means to promote such an undertaking. Therefore our only hope lies in the possibility that some noble philanthropist can be made to see the great and wonderful good to be done in behalf of the ocean going public by providing the nominal

funds needed to start the movement I have suggested and keep it going one year. Within this period, I am sure enough young capable doctors would become members and sufficiently realize the organization's benefits to insure its future financial independence.

As a matter of practical judgment one or more of the large steamship companies would find it a most profitable investment to finance this proposed organization of ship surgeons. The saving on one trip by a competent doctor who could protect against innocent violations of port regulations, the acceptance of diseased steerage passengers, and so on, would furnish funds to several times over the amount needed to finance this proposed association of ship surgeons. The whole project would make for efficiency and it would seem to require no argument to show that the higher the efficiency on the part of ship surgeons the greater the protection against the dangers and losses from incompetence.

With these remarks I will leave the subject. The life of a ship surgeon has much that is pleasant in it, and it only needs raising the personnel of those who are to take up this phase of medical practice to increase the respect for ship doctors, to give better service to the traveling public, to insure greater protection for ports of entrance or call against contagious disease, and finally last but not least, to safeguard the ship companies against the losses and needless expense now too often caused by the ignorance or indifference of those who are serving as ship surgeons.

In a word, I want to see much greater care used in selecting ship doctors, and sufficient inducements offered to secure men who can fill such positions with credit to themselves and honor to the noble profession of medicine.

## THE ELECTRICAL TREATMENT OF WATER.

BY

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The experiments were divided into three series, as follows:

SERIES I.—To ascertain the effect of the electrical current, constant and alternating, with reference to its germicidal action pure and simple; that is, without taking into account the action of the gases generated, or of the metallic salts imparted to the water.

SERIES II.—Devoted to ascertaining the effect of the gases, produced by electrolytic action of water, upon organisms.

SERIES III.—The effect of the metallic salts, produced by the electric action on the poles, and their subsequent action by sedimentation.

In all 43 different observations were made, the quantity of water used, the current—both by volts and amperes—being accurately stated under each set. Special organisms were chosen for the purposes of the experiments—(1) the *Bacillus Coli Communis*, and (2) the *Bacillus Prodigious*, both of these are common organisms found in drinking waters, the first being pathogenic and the microbe most sought for generally in bacteriological tests of water.

### SERIES I. THE EFFECT OF THE ELECTRICAL CURRENT PURE AND SIMPLE:

Set A.—Two plates were used situated at each side of a glass tank 5 inches apart; one gallon of water was used and a direct electrical current of 2/20ths of an ampere and 90 volts.

i. Duration of current, 7 minutes. Cultures taken from this sample showed no reduction in the number of organisms after the passage of the current.

ii. Duration of current, 14 minutes. Result the same.

iii. Duration of current 21 minutes. Result the same.

iv. Duration of current, 28 minutes. Result the same.

*Set B.*—Direct current, 2 amperes, 65 volts. Under these conditions, where the plates occupied the same relative positions, the results were precisely as in Set A; that is, no effect upon the organisms whatever.

*Set C.*—Having ascertained that the direct current, with the plates in the position above noted, had no effect at all, it was decided to ascertain the action, if any, of the alternating current of high power. A special tube was manufactured for carrying the water and poles. Cultures of the bacillus coli were inoculated into the water and six different observations with varying currents were made. The results can be set down briefly without entering into elaborate detail. (It should be noted that in this set of experiments the generation of gas was always carefully watched so as not to interfere with the experimental results, and also that the passage of electricity did not raise the temperature of the water appreciably, so that no vitiation of the results took place). The currents used were—1,000 volts, 5,000 volts, 10,000 volts, 20,000, and 40,000 volts.

In some of these the time of passage of the current was short, in other words, more like a shock; in others the current was allowed to run for a short time to see whether continued action had any effect upon the germs.

In every case the results were negative so far as the germicidal action was concerned, for so far as we could see the strongest currents had absolutely no effect upon the bacteria.

## SERIES II. THE EFFECT OF GASES PRODUCED BY ELECTROLYTIC ACTION ON WATER UPON THE LIFE OF GERMS.

*Set A.*—Six plates were used in the tank, giving a space between each of  $\frac{3}{4}$  inch; the same amount of water was used (one gallon) and the cultures were the same. Direct current, 2.5 amperes and 55 volts.

i. Duration of current, 15 seconds. No diminution of growth.

ii. Duration of current, 30 seconds. No diminution whatever in number of organisms present.

iii. Duration of current,  $2\frac{1}{2}$  minutes. No diminution of growth.

In this set the time of treatment was rather short and it was noted that the gases generated had not the opportunity of becoming intimately mixed throughout the water.

*Set B.*—The same conditions in the tank, as regards plates, water and cultures. Direct current, .95 amperes and 21 volts.

i. Duration of current, 3 minutes. No diminution in number of bacteria.

ii. Duration of current, 6 minutes. No diminution in number.

In this set a weak current was used over a longer time but without any better results than in Set A.

*Set C.*—Conditions in the tank as regards plates, water and cultures, same as before. Direct current, 2.5 amperes and 60 volts.

i. Duration of current,  $1\frac{1}{2}$  minutes. No visible reduction in number of germs, 26,688 per cc. (original count before passage of current about 28,000 per cc.).

ii. Duration of current, 5 minutes. A visible reduction in the number of organisms took place, actual count, 17,400 per cc. It may also be remarked that the bacillus coli seemed to be attacked more actively than the bacillus prodigiosus.

iii. Duration of current, 8 minutes. Still further reduction though not very marked in number of organisms, actual count, 16,800 per cc. The colon bacillus again was decidedly less numerous.

*Set D.*—Having found by the last experiments that the gas had a certain effect, the plates were differently arranged with a view of obtaining a thorough admixture of water with the gas produced and the maximum amount of the latter with a given current. Two plates were used  $\frac{7}{16}$  of an inch apart, the space between being filled with water inoculated with cultures above noted. The actual quantity of water was 200 cc. or 7.04 oz. Direct current of 5 amperes and 25 volts.

i. Duration of current, 2 minutes. Very slight diminution in number of organisms, actual count, 34,560 per cc. (original count before passage of current about 40,000 per cc.).

ii. Duration of current, 4 minutes. Very marked reduction noted in this experiment; actual count 1,670 per cc.

iii. Duration of current, 6.5 minutes. Large reduction of organisms, 1,440 per cc.

In this set of experiments much better results were obtained than in any of the former, proving that the gases produced certainly have some lethal effect upon the bacteria.

*Set E.*—The two plates were used precisely as in Set D., the quantity of water 200 cc. and the cultures the same as before. Direct current, .75 amperes, 35 volts.

i. Duration of current, 2 minutes.

Moderate reduction of organisms, 8,400 per cc. (original count before passage of current about 34,000 per cc.).

ii. Duration of current, 4 minutes. Marked reduction, 3,240.

iii. Duration of current, 7 minutes. Marked reduction, 2,040.

iv. Duration of current, 10 minutes. Marked reduction, 2,008.

The reduction of organisms in this last set is decidedly the most marked of all. Two prominent effects are brought out—first, that both kinds of organisms are reduced; and second, that they cannot be completely got rid of apparently, for, it will be noted that the reduction in iii. and iv. remains constant. A word will be said about this in the summary.

*Set F.*—Six plates were used here with equal spacings of  $\frac{3}{4}$  inch; the quantity of water is one gallon, the culture used the bacillus coli and a direct current of 1.6 amperes and 35 volts.

i. Duration of current, 3.5 minutes. Slight reduction of organisms, 9,600 per cc. (original count before passage of current about 24,000 per cc.).

ii. Duration of current, 6 minutes. Much the same result.

iii. Duration of current, 12 minutes. Distinct reduction, 5,520 per cc.

iv. Duration of current, 16 minutes. Reduction more marked, 3,480 per cc.

v. Duration of current, 20 minutes. Still more marked reduction, 1,920.

This set shows that when the gases are fairly well mixed up there is no doubt about their action on the organisms and the duration of the current is the all-important factor.

*Set G.*—Conditions of plates, tank, water and current precisely as in Set F., this set being instituted to see whether any result

would be obtained by the passage of the current for a short time.

i. Duration of current, 1.5 minutes.  
No reduction of germs.

ii. Duration of current, 2.5 minutes.  
Very slight reduction indeed, hardly noticeable.

SERIES III. EFFECT OF METALLIC SALTS  
PRODUCED BY ELECTRICAL ACTION ON  
THE POLES IN WATER, AND THE  
SUBSEQUENT SEDIMENTATION:

*Set Aa.*—Two plates were used, one on each side of the tank, the space between being 5 inches; one gallon of water and cultures of the colon bacillus. Current  $\frac{1}{10}$ th ampere and 90 volts. The duration of the current was 30 minutes and the water was then allowed to stand. With this current very little visible metallic matter was introduced into the water and consequently there was but little matter to settle down.

The results showed that there was no diminution in the number of the bacteria in any way.

*Set Bb.*—Six plates were used with an equal spacing of  $\frac{3}{4}$  inch between each; one gallon of water and cultures of the colon bacillus and the bacillus prodigiosus; a direct current of 1 ampere and 20 volts. The duration of the current was 7 minutes and the water was then allowed to stand, 1st for three hours; and 2nd, for 24 hours. There was a fairly marked amount of metallic matter in the water giving rise to the well-known flocculi, some of which settled down at the bottom.

After three hours' settling the results showed that there was a reduction in the number of organisms to just  $\frac{1}{3}$ th their original number. After 24 hours' settling a larger reduction was noted, coming down

to  $\frac{1}{17}$ th of their original number.

*Set Cc.*—Six plates were used; cultures and amount of water the same. Current direct, 2.5 amperes and 60 volts. Duration of current, 8 minutes; the water was then allowed to settle for 24 hours.

The reduction in the number of organisms was very noticeable, being  $\frac{1}{20}$ th of their original number.

*Set Dd.*—In these experiments two plates were used, near together,  $\frac{7}{16}$  inch, the quantity of water in between being 200 cc., cultures—the colon bacilli, and bacillus prodigiosus. Current direct, .5 amperes and 25 volts. Duration of current, 7 minutes. The water was allowed to settle for 15 minutes only.

Result, no appreciable reduction in the number of bacteria. 12 hours' settling gave a very decided result or reduction to  $\frac{1}{5}$ th their original number. After 60 hours' settling the results were rather curious—it was here noticed that the organisms were almost as plentiful as they were in the original water before the current was passed.

*Set Ee.*—The same conditions of plates; water, as in Set Dd. Direct current of .75 amperes and 35 volts. Duration of current 10 minutes; time of settling, 24 hours.

Results very marked indeed, only 140 colonies out of 35,000 were found, and of these only two were the colon bacilli.

*Set Ff.*—Six plates were used in the tank at equal spacings of  $\frac{3}{4}$  inch between; cultures, the bacillus coli only. Direct current, 1.6 amperes and 35 volts. Duration of current, 20 minutes; 20 hours' settling.

The results absolutely sterile.

At the end of that time cultures were also taken from the matter which had settled to the bottom of the tank and it was here found that some of the organisms

were alive, but very few, only 750 out of a total of 35,000.

*Set Gg.*—Same conditions, cultures of colon bacilli only. Duration of current  $1\frac{1}{2}$  minutes, and allowed to settle for 1 hour. Practically no diminution was noticed. Count=21,600.

Same conditions, cultures of colon bacilli only. Duration of current,  $1\frac{1}{2}$  minutes, and allowed to settle.

i. Settling for one hour, practically no diminution noticed, count, 21,600.

ii. Settling for 12 hours, very little reduction—15,500.

iii. Settling for 24 hours, much the same—16,000.

### Summary.

In discussing the first series of experiments, that is, on the electric action pure and simple, we may briefly dismiss this for the experiments speak for themselves practically and demonstrate beyond a doubt that electricity, whether direct or alternating, does not affect germs.

With reference to Series II., that is, the effect of gases produced by electrolytic action, the results here are decidedly more encouraging, but require further attention and interpretation. The success, or otherwise, depends entirely upon the strength of the current and the time of its application to a given quantity of water. The amount of the gases is of course directly proportionate to the current and the time, and it is to be accentuated that unless the quantity of the gases is of such an amount to mix thoroughly with all the water and to come into intimate contact with every part, satisfactory results will not be obtained. But when such is the case there is every reason to think that something might be made out of this gaseous action. We may

point out also that the effects of the passage of the current to be successful must be visible, that is, we must have a visible amount of the gases well mixed up with the water, and also concomitant with that a certain amount of metallic material produced.

Set A. in this series bears out these remarks very markedly. Set B. is of a similar character, the time being longer. But here the gas produced was only in contact with the water immediately contiguous to the plates and that there was a large intervening portion absolutely free from gas and metallic matter. The results are all negative.

In Set C. the conditions are the same as regards the position of the plates, but the current is decidedly stronger, and applied for a still longer time. This set of experiments again shows only such a slight diminution of organisms that may be reasonably accounted for by the action of the gases next the plates, and that a large part of the centre was entirely unacted upon. When we come to Set D. where we have the plates so arranged that gases can mix with the whole of the water, or nearly all, then we begin to get some encouraging results. Set E. which is arranged on the same plan but with a very slightly stronger current, gives results practically the same as in Set D. Set F. shows an arrangement whereby we could treat one gallon at a time and here we get, proportionately, that is, considering the current, its time of passage through the water, and the quantity of the water, quite as satisfactory results as we did in Sets D. and C. In these latter sets of experiments it may be noted that the samples of water treated are never sterile, even at the end, and it may be argued as to whether the gases have only a limited ac-

tion, though I think the correct interpretation of this is accounted for by the fact that there is always a portion of the water near the bottom which is never quite intimately mixed up with the gases, and I feel certain that were a little mechanical ingenuity brought to bear upon the subject so as to arrange the plates and the water in order that the latter may become intermingled thoroughly with the gases, then we should get uniform results throughout.

Set G. shows that the current must act for a definite time, say about ten minutes, and the interpretation of this is all with reference to the gases produced; the short duration of the action of the current was not sufficient to generate the requisite amount of gas for the latter to be thoroughly mixed with the water.

Before leaving this series a word may be said about the action of the gas. From the experiments I feel certain of two facts with reference to this subject: First, that the gases produced do actually kill a large number of the micro-organisms but that to kill them all the conditions of the experiments must be such as to bring all the organisms into contact with the gas.

It will be seen from the next series of experiments (Series III.) that a certain number of organisms are carried down to the bottom and are not killed, and this brings out the second fact, namely, that unless a fairly strong current is used a large residual number of living organisms will be found in the lower part of the tank, and that the stronger the current; or, in other words, the stronger the gases produced, the less this residual number becomes.

The position of the plates is an all-important factor too; for instance, where the

plates are so wide apart that the gases do not travel uniformly between the two, and are not thoroughly mixed up with the water, the results are unsatisfactory.

Turning to Series III. the results are decidedly marked; but here it will be noted that it is rather difficult to dissociate the effects of the gases and the effects of the metallic salts. By this I mean that the stronger the current used the more marked the reduction in the number of organisms. Now under these conditions, besides the generation of a larger amount of metallic matter which is thrown into the water, we have at the same time a correspondingly larger amount of gases too. Set Aa., in the experiments, proves beyond a doubt that unless the metallic matter is quite visible in the water, sedimentation has no effect, for the simple reason that there is nothing to sediment. When we come to Set Bb. where the conditions are such as to give us visible flocculi, the results then depend entirely upon the length of time of settling, viz.: a 24 hours' settling gives three times better results than 3 hours. In Set Cc. the current is stronger and as a natural result the amount of metallic matter larger, sedimentation being as a corollary more complete. In Set Dd. we have the sedimentation results fairly well marked, as borne out by the other experiments, but the curious remark made at the end with reference to the 60 hours' settling is to be interpreted in this way—that a moderate number of organisms were left alive at the bottom of the tank and that 60 hours was sufficient for them to multiply and distribute themselves through the water again. There was food enough in the water for them to accomplish this. Set Ee. gives very satisfactory results and simply adds more weight to the remarks already made.

Set Ff. is decidedly the most striking in the series. It proves that with a fairly strong current of moderate duration and a reasonable time for settling allowed, the results are perfect. It is important to note the results of the growth from cultures taken at the bottom of the tank after this settling has taken place. There it will be noted that only 750 out of a total of 35,000 are alive. Now this is important, especially when taken in conjunction with the results of Set Gg. where it is shown that the cultures taken from the sediment under those conditions show only a slight decrease of the total number. The interpretation of this is as follows: That the metallic flocculi are capable of carrying down bacteria to the bottom of the tank but that they in no way exert any lethal action whatever upon them. The reduction in Set Ff. compared with Set Gg., is easily accounted for when we take into consideration the lethal action of the gases generated at the same time as the metallic material is given off the poles. Now with the current in Set Ff., the amount of gas was copious and as completely mixed up with the water as could possibly take place under the conditions of the experiment; whereas, in Set Gg. the amount of gas was nothing like enough to exert a lethal action of any notable amount, though the metallic flocculi produced were sufficient to carry down a certain number of bacteria, but such bacteria were living.

It is to be specially noticed that in experiments of Series II. dealing with the gaseous action on the organisms, no settling was allowed to take place, and that although a certain amount of metallic matter was present in the water, this had not time to sink to the bottom of the tank and carry the organisms with it, but was taken in the sample of water for a culture, and that

therefore any diminution in the number of organisms must be attributed to the lethal action of the gases and not to the metallic material, for we know that this latter possesses no germicidal properties whatever, e. g. in Set Gg., Series III.

Another fact is that in all these experiments the temperature of the water was never allowed to rise appreciably so that any effects of the results attributed to heating could be absolutely eliminated.

**Final Conclusion.**—As a final summing up, to give my opinion in a few words, I would say that under well devised conditions the treatment of water by the gases produced by electrolytic action on water gives such decided results as to make it one of the two important, if not the important item, and I should think it possible that some scheme might be devised whereby efficient treatment could be imparted to water without relying upon the action of sedimentation. This settling action is undoubtedly an important factor to be dealt with, and if it is feasible to combine the effects of the gases and the effects of sedimentation into a working scheme the results could be absolutely relied upon.

The action of electricity pure and simple is useless.

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**Calcium Chloride in Erysipelas.**—Kawakami (*Sei-I-Kawi Medical Journal*, April 10, 1914), reports thirty cases of erysipelas treated by injection of five to twelve drachms (20 to 50 c.c.) of a one per cent. solution of calcium chloride. After the injection the patient generally has a sense of warmth; in rare instances temporary palpitation. At times there were sweating, fever, thirst and general weakness for a few hours. The local condition markedly improved, or at least, the progress of the disease became slower and a tendency to speedy recovery was noted.

Conducted under the Editorial Direction of Dr. J. W. Wainwright.

**Tuberculin in Tuberculosis.**—W. B. Metcalf, (*Medical Brief*, January, 1916,) writes very entertainingly and with full faith in the benefits to be gained from the proper use of tuberculin in all phases of the disease. We have space only for Dr. Metcalf's conclusions. He thinks it strange that it has taken specialists so long to recognize the value of tuberculin, both as an aid to diagnosis and treatment. The ophthalmologists now recognize its value in tuberculosis of the cornea. Corneal, renal, mastoid, bone and many other tubercular lesions that have not responded to surgery, diet and fresh air treatment, have yielded to tuberculin when properly given.

Tuberculin, the author claims, has three distinct values: It is a positive diagnostic agent when the presence of the disease can not be determined by the ordinary physical signs. It has an immunizing power equal to that of any of the serums, a statement based upon experience, experiment and our knowledge of the antibodies. Its curative power in the treatment of tuberculosis is equal to the curative power of any of the serums in their respective fields, provided the same conditions are applied. The early use and proper dose. These statements are based upon the use of Koch's tuberculin *old*, the proper dose being determined by the use of the "temperature index."

Metcalf states that in his private practice he has come to use Koch's tuberculin in every case of tuberculosis, no matter where located, not that he regards it a cure in every case, but that he believes that if given in accordance with the showing of the "temperature index" it can do no harm and will help in every case. Finally, he concludes, we must not lose sight of the protection and immunizing power. It is a remedy with which great good can be done

as well as great harm; but the proper dose can be easily determined for each case, and with increased experience it is, of course, possible to increase the good results.

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**Ipecac and Emetine in Pyorrhea Alveolaris.**—John S. Ruoff, Assistant Surgeon United States Public Health Service, (*Public Health Reports*, Reprint No. 320), gives details of an investigation made by himself to determine the curative value of ipecac and emetine in pyorrhea alveolaris. Of 190 examined 187 showed endameba. Seventy-eight were treated; 14 had no clinical symptoms of pyorrhea, while 64 had one or more of the clinical symptoms, such as pockets, pus, loose teeth, receding gums, and bleeding gums. The last named symptom was the most frequently found, occurring in 51 of the 64 cases. Each patient was given an initial examination; history. He was then sent to the dentist where a careful examination was made of the mouth. The teeth were scaled, old roots and hopeless teeth extracted and the mouth put in good condition. No other operative procedures were attempted, and no routine treatment of teeth or gums other than by the brush in the patient's hands. A microscopical examination was made for endameba.

At the time of scaling the teeth each patient was given fluid extract of ipecac to use locally with general instructions to use two or three drops on the tooth brush; later to use 10 drops of the fluid extract in one fourth glass of water as a mouth wash after cleansing the teeth night and morning. Three were moderately improved; result doubtful in 1; 2 greatly improved; condition in the rest unchanged, in a class No. 1

of 20 men. In class 2 consisting of 12 men, all received  $\frac{1}{2}$  grain (0.03 gram) of emetine on consecutive days, and examined on the fourth day. Six were negative after three doses each; one discontinued treatment on account of rise of temperature. The remaining 5 received three more doses of  $\frac{1}{2}$  grain on the next three days; and all found negative after the sixth dose. The subsequent history of class 2 showed, notwithstanding all continued to use the fluid extract locally, endameba three weeks later.

Then 13 men in class 3 doses of emetine; 5 in class 4; 12 in class 5; 16 in class 6, all treated with  $\frac{1}{2}$  grain doses of emetine.

A summary of results of the 78 cases treated shows that none lost their endameba permanently. The condition of teeth and gums was greatly improved in 3 cases, moderately improved in 9 cases, slightly improved in 22 cases, while 41 cases remained the same; the results were doubtful in 2 cases and 1 case became worse. Practically all that were found negative for endameba at the conclusion of injections were found positive from two weeks to four months afterwards in spite of using a solution of ipecac as a mouth wash.

**Conclusion.** Emetine is an amebicide but alone will not cure pyorrhea alveolaris.

**Distilled Water for Multiple Ulcers.—** Stephens, (*London Lancet*, December 18, 1915), describes a case of a woman, sixty-three years of age, who had been suffering for over six months from ulcers of the thighs and breasts. Mercury and iodides had been tried internally and black as well as red wash externally with no success. The author suggested subcutaneous injections of distilled water, if necessary repeated two or three times. At the same time the patient was given three grains of calcium iodide three times daily for four weeks. After the first injection, which was given on August 19th in the loose tissue below the shoulder blade, her general condition was greatly improved, while the ulcers looked healthy and healing. The second injection was given on August 26th and the third on September 13th, by which time nearly all of the ulcers except one on the thigh had closed, the smaller ones covered with healthy skin. At this time the

patient's general appearance had greatly improved. No blood tests were made so it cannot be definitely stated that the ulcers were specific, but the appearances were very suggestive.

Stephens used gasoline to wash the lesions and when this had quite evaporated, dusted them over with boric acid.

**Tuberculin Therapy.—** Shively, (*New York Medical Journal*, January 8, 1916), declares that there is a general agreement among sanatorium physicians that patients who receive tuberculin treatment lose their bacilli more readily than those who do not; that a greater proportion are discharged arrested; a larger number restored to working efficiency and that after a period of years their cure is better maintained than that of patients who have not had tuberculin. Besides these regular routine effects which are gradually obtained over a long period of time and which are perhaps not very striking, but are after all of great importance to the individual patient who may thereby attain a practical arrest of his disease, there are the occasional spectacular cases all too few in number, but which all who have much to do with tuberculin see at times. These are the fortunate ones who literally go ahead by leaps and bounds, for whom the tuberculin treatment is a real boost, imparting what appears to be just the necessary impetus to recovery and sustained resistance to their disease.

**Chlorine Water as a Wound Dressing.—** Nelson, (*British Medical Journal*, December 4, 1915), records his favorable experiences with chlorine water as a wash and dressing in a variety of septic and infected wounds. It is prepared by the action of hydrochloric acid c. p. on potassium chlorate. The gas being dissolved as it is formed in the water. (It may be made by placing in an open wide mouth quart bottle, 40 grains of potassium chlorate to one pint of cold distilled water, adding at once  $2\frac{1}{2}$  fluid drams of hydrochloric acid and shaking the bottle constantly until reaction ceases and then only corking or stoppering the bottle. As the gas is liberated at once

upon the acid coming into contact with the potassium chlorate, there would be danger of exploding the bottle if it were closed. A safer but less satisfactory way for one not a pharmacist will be to first place the potassium in a large mortar or beaker bottle, then add the acid, and at once the water, agitating with a glass rod until ebullition ceases and then transferring to a glass stoppered bottle. Care should be taken not to breathe the chlorine gas during the procedure, as it is a violent tissue poison. Editor.) Nelson used this solution undiluted as a wash; diluted to three times with water for dressings; diluted to five times for a throat gargle. Under this procedure a large number of wounds healed without pus formation. He concludes with the suggestion that the above dilutions should prove serviceable in pyorrhea alveolaris, but care should be taken not to use it too strong for fear it destroy the enamel of the teeth.

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**A Specific Treatment for Typhoid.**—Meyer, (*Berliner Klin. Wochenschrift*, June 28, 1915), writes that the exact mechanism through which recovery from typhoid is brought about is not yet known. There is evidence, however, which indicates that the bacteriolysins present in the circulation are of greater value than are the agglutinins. The success of the vaccines in prophylactic inoculation suggested their use in treatment. They were given trial in a large number of severe cases and the results compared with control cases, with the result that in those receiving vaccine, the mortality was 9.6 per cent., while that of those who did not receive the vaccines was near 20 per cent. In the cases receiving the vaccines was a marked tendency to a lowered temperature earlier and with greater rapidity but seemingly this treatment did not reduce a tendency to complications. In forty-five per cent. of the cases treated with vaccines in the early stages of typhoid the fever declined within seven days; the same effect followed in eighty-three per cent. of the cases receiving the vaccine later in the disease. No severe reaction followed the use of the ether killed vaccine or a sensitized one. The initial dose was 500 million organisms; increasing doses given at intervals of three to four days followed. The vac-

cines were given by both subcutaneous and intravenous injections. Better results were obtained when the vaccine was given in the later stages of the disease for the purpose of preventing sequelae and relapses. It was found that the blood serum of recovered patients treated with large doses of vaccine had great therapeutic value in treating the most serious cases of typhoid.

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**Electrargol.**—G. V. Brown at the meeting of the American Association of Obstetricians and Gynecologists, Pittsburgh, September 14-16, 1915, (*New York Medical Journal*, December 25th, 1916), described a colloidal silver made in France, known as electrargol. He stated it to be heterogeneous, including two essential parts, a liquid medium, and solid particles; the latter being visible only by ultramicroscopic means on a dark ground. A multitude of particles can be observed in the liquid, each of which has an electrical charge. Each ion has its own antiseptic power, thus combining a larger surface of antiseptic power than other colloidal silver preparations, with which one obtained a protecting influence on the body by stimulation of leucocytes to phagocytosis as well as a catabolic action on bacteria. He obtained virulent streptococci and made cultures in ascitic bouillon, putting only five drops of electrargol into a tube of ascitic fluid. No growth was obtained. Electrargol was sprayed on a growth of bacteria on ascites agar plates; it was transplanted on the islands, but no growths were obtained from those which came in contact with electrargol. If we are to demand an ideal treatment to conquer septic disease, one having a catabolic action on the invading organism, as well as a stimulating action on the body's defensive organization, then Brown regards electrargol as able to meet the conditions. Its germicidal action was demonstrated both *in vitro* and *in vivo* as well as in the stimulation of the leucocytes.

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**Autogenous Vaccines in the Treatment of Bronchitis and Asthma.**—Robt. H. Babcock of Chicago, in a paper read before the Mississippi Valley Medical Association,

Lexington, Ky., October 19-21, 1915, and published in the *Lancet-Clinic*, February 12, 1916 on the above timely subject, concludes as follows: Autogenous vaccines prepared from the sputa have yielded such results in three cases of acute bronchitis, and four of chronic bronchitis associated with attacks of spasmodic asthma, as to warrant him in recommending this mode of treatment as against the old time use of expectorants by mouth.

That in bronchitis independent of asthma, the organisms have been mainly of bacillus mucosus, the diplococcus mucosus, the micrococcus catarrhalis and an influenza like bacillus, while in bronchial asthma an anaerobic fusiform bacillus has been added.

The asthma has yielded to this vaccine treatment only when this anaerobic fusiform bacillus has been largely present in the vaccine.

Great care should be exercised in the use of vaccines, that the dosage be not so large or so often given as to cause reaction, since this reaction, whether general or local, indicates a negative phase and aggravates the patient's condition.

The main drawback to the use of autogenous vaccines is the necessity of perhaps several cultures, and the preparation of new vaccines should the cultures show that some of the originally found germs have disappeared or become subordinate in number to others.

New vaccines should be prepared whenever the condition of the patient seems to have come to a standstill.

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**Strontium Salicylate.**—Blankenhorn, (*Journal American Medical Association*, January 29, 1915), summarizes effects of strontium salicylate in twenty-three cases including acute and chronic articular rheumatism; gonorrhreal and chronic arthritis; sciatic neuritis; acute and chronic endocarditis; cervical adenitis; lobar pneumonia; acute articular rheumatism, etc. There was nausea in all but two of the twenty-three cases as well as ear symptoms; relief of pain from marked degree to slight; no relief in six cases; antipyresis from 1 to 6.5° F. in three cases, slight in seven and none in thirteen. The strontium salicylate was given in doses of 20 grains at one hour in-

tervals. The total amount ranging from 80 to 500 grains. Fifteen of the cases were males, eight females; the ages were from 12 to 48 years.

Blankenhorn concludes that the mean toxic dose of strontium salicylate is the same as that of sodium salicylate; that the strontium salt produces the same gastric and other toxic symptoms as the sodium salt; that the strontium salt is no more effectual in the relief of pain and is not so convenient to give as the more soluble salicylates.

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**Open Air Treatment in Surgery.**—Markoe, (*Journal-Lancet*, December 1, 1915), reviews the literature on open air treatment and exposure to sunlight. He concludes that in the present war, the wounded treated in open air field hospitals have seemingly done better than those in closed wards. Markoe discusses the results of this treatment in septic cases at the Lying-in Hospital in New York City and shows that those cases kept out on the roof of the hospital improved in a much larger number of cases than those with the same complaint treated indoors. There was 100 per cent. mortality of the indoors patients, in 21 cases in the hospital more than five days, while there were 22 recoveries of 35 treated on the roof for more than five days.

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**Vaccine Treatment of Gonorrhea.**—Wardens, (*Journal American Medical Association*, December 11, 1915), conducted experiments which proved that the antigenic properties of the gonococcus resided in a lipoid fraction which could be chemically isolated from fresh cultures, and not in the protein fractions. This antigenic lipoid was used for complement fixation tests in a parallel series with commercial antigen. In acute cases there were twenty per cent. of positive reactions with the commercial, and fifty per cent. with the lipoid antigen. In subacute cases the figures were twenty per cent. and seventy-five per cent. respectively. The lipoid extract was also used in the treatment of a number of cases and in general gave good results, with certain cures in some.

Conducted under the Editorial Direction of Dr. Henry R. Harrower.

**Some Points on Dyspituitarism.**—This condition, as its name indicates, includes the dyscrasias of the pituitary gland, most common of which are hypopituitarism and hyperpituitarism. Strangely enough both may be present simultaneously, for one part of the gland may be inordinately active whilst the other part is not functioning sufficiently. Or, again, either of these two conditions may supersede the other, though usually hyperpituitarism is more often followed by hypopituitarism.

Some points about the diagnosis of these two dissimilar conditions may be of interest as in the earlier stages, such conditions are distinctly benefited by suitable organo-therapeutic medication.

Hypopituitarism, probably the most common of the pituitary dystrophies, usually causes four main symptoms: 1. An undue increase in the deposit of fat with later obesity, which is possibly due to a marked increase in the tolerance for sugar (and often an abnormal desire for sweets) which is also present. 2. Disturbances in the skeletal growth, especially marked in the young in whom the epiphyses are often un-united and the stature is small and stunted. 3. Genital dystrophies, suppressed sex-manifestations and reduced cellular activity with dry, harsh skin, slow mentality and reduced body temperature. 4. Asthenia, especially of the unstriped muscles associated with slow pulse, reduced blood pressure, enuresis, etc.

The mental changes are often quite marked especially in children. There is lassitude, drowsiness and somnolence; the child is dull and apathetic; backward in his studies and easily discouraged by the seeming formidability of his simple tasks. The child frequently has difficulties with his playmates and lacks self-reliance and control.

The genital changes include postponement of puberty, lack of the pubertal growth of hair, cryptorchism or infantile uterus, azoospermia or amenorrhea and occasionally a tendency toward development of characteristics of the opposite sex, especially in males, while normal sex development is prevented.

The treatment of hypopituitarism is comparatively unsatisfactory, for usually the disease is due to a cystic or tumor degeneration of the gland and it is not possible satisfactorily to replace the missing hormones which are so essential to growth and proper development. However, pituitary organotherapy has been used with moderately good results, Cushing recommending up to 12 or 15 grains of total pituitary substance three times a day. Of course where a pituitary tumor is present with localized pressure symptoms—as bitemporal hemianopsia with progressive blindness, severe headaches with nausea and vomiting—decompression must be performed and while this may lessen these serious symptoms, it is rare that the other symptoms pertaining to metabolic conditions are influenced.

Hyperpituitarism causes a number of symptoms quite the opposite of those due to decreased glandular activity; although it must be remembered that with true hyperplasia of the gland there may be local pressure symptoms identical with those of tumor growth with a reduced glandular function. These have just been mentioned. The functional changes, however, are quite different. The stature is increased and children often grow very large for their age and are tall and bony framed. The eyes are widely spaced, the face is broad and the jaw square and prominent. Their feet and hands are unduly large, the hairy growth is increased and hypertrichosis is not uncommon. The

excessive stimuli to certain metabolic activities may cause wasting and intolerance to carbohydrates with polyuria and not infrequently glycosuria.

The mental powers are peculiarly influenced. Instead of being the opposite of those enumerated as most common in hypopituitarics, there is lack of concentration and indecision, irritability and distrust; though occasionally at certain periods there may be an unusual degree of alertness. These individuals do not sleep well, are excitable and overdeveloped sexually and precocious.

This condition is not easily treated and, fortunately, is quite rare. As is usual, the organotherapy of "hyper"-conditions is not so satisfactory as that of "hypo"-conditions. Perhaps there may be some prospective value in a suggestion of Ludlum and Corson-White, *Am. Jour. Insanity*, (April, 1915) that there is a group of cases of hyperpituitarism that improve when "the opposite organic extract" is given. This they state is the Brown-Séquard fluid, which in other words is orchitic substance.

Since the pancreas is believed to oppose the pituitary or *vice versa*, (as will be seen by their opposite influence upon sugar tolerance) there may be a possible chance in pancreatic organotherapy. Or a combination of these two anti-pituitary influences might be used; but it is not yet determined how to treat hyperpituitarism successfully.

been called in more recent years the fashionable "neurasthenia." The typical neurasthenic generally, if not always has a disturbance of the adrenals on the side of insufficiency; the blood pressure is almost always low and the circulation poor. Mental exertion often causes extreme weariness and exhaustion. There may be a vasomotor paralysis which causes chillings, flushings, cold or burning hands or feet, drowsiness when the patient is up and wakefulness on lying down.

It is believed that many individuals presenting the classical symptoms of neurasthenia with low blood pressure, decreased mental elasticity, mental and physical depression with the fear that they cannot now accomplish their usual good mental work, with the story that they have "lost their nerve," with a vacillating and indecisive frame of mind, are suffering from a functional hypoadrenia. In many cases of this character Williams has found that two to four grains of desiccated adrenal gland, three times a day, has caused improvement and the administration of this substance by mouth has frequently raised the blood pressure as well as controlled the physical and mental derangements.

It must also be remembered that the typical neurotic very often has a disturbance of the thyroid gland and this in one patient may cause hysteria and in another depression; or both conditions may occur in the same patient at different times.

There is not much doubt that the cause of neurasthenia is a disturbance of one or more of the internal secretions, but just which glands are at fault is difficult to determine. Testicular and ovarian disturbance, especially on the side of deficiency, are known to cause general depression, hysteria, hypochondriasis, melancholia and digestive disturbances. In fact as had been repeatedly stated in this department, in "run-down conditions" of which neurasthenia is a typical example, one must expect a pluriglandular insufficiency; and under such circumstances Williams' suggestion to use total adrenal gland may well be amplified and thyroid, pituitary or gonad extracts given as the circumstances indicate. The value of pituitary medication is especially emphasized, Williams remarking that this gland furnishes a stimulant to the adrenals and hence "it might be well to consider adminis-

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**Adrenal Insufficiency in Neurasthenia.**—The glands of internal secretion are being connected with the causation of the neurasthenic syndrome more and more frequently and rightly so. Recent confirmation of the position taken in the editorial columns of AMERICAN MEDICINE (August, 1915, p. 590)—that "it would appear that the organs of internal secretion are to be charged with causing many of the disorders which together form the neurasthenic syndrome"—is found in an article in the department on "Therapeutics" in the *Journal of the American Medical Association* entitled "Neurasthenia—Suprarenal Insufficiency" (Dec. 18, 1915, p. 2166).

According to Tom A. Williams the syndrome of adrenal insufficiency is really a form of nervous prostration or as it has

tering a small dose of this gland in conditions of subsecretion of the suprarenals, especially as part of the pituitary furnishes a basopressor substance."

It is confidently believed as our clinical experience is extended and the suggestions made here and elsewhere are put into practical use, that we will find organotherapy of considerable efficacy in the successful control of many of the manifestations of neurasthenia.

**Stimulating the Kidneys in Eclampsia with Nephritin.**—In the discussion of a paper on the treatment of eclampsia read before the Los Angeles Obstetrical Society, December, 1915, McNeile remarked that in his experience with over 100 cases of prepartum and postpartum eclampsia, he had found nephritin, a preparation of the renal glomerular tissue, of considerable value. In one recent case the amount of urine in 24 hours was increased from 7 to 50 ounces, and in practically every case a certain degree of benefit was noted. Thirty grains a day, in divided doses, was the usual amount administered; and in his hospital practice nephritin was given simultaneously with eliminative treatment in all cases where eclamptic seizures seemed to be pending.

McNeile also stated that as eclampsia might reassert itself quite some time after delivery, even when the convulsions seemed to be well under control, the administration of nephritin was a routine in all cases who had manifested the least trace of the symptoms, and was always continued for several days after all danger of its recurrence was over.

The following remarks taken from a personal communication in January, are worth setting down here. McNeile writes: "From recorded results I now believe:

"That nephritin exerts a specific action upon the kidney of toxic or eclamptic patients, stimulating their activity and increasing the output of urine to a marked extent.

"That it can be used to advantage as a prophylactic against eclampsia, especially in that type of cases in which the early signs and symptoms of the toxemia appear gradually.

"That even aside from the increased elimination which it favors, the toxic condi-

tion is improved. This is marked in the cases in which mental apathy is pronounced.

"That nephritin must not be considered to be a specific and it is only to be used in connection with other approved methods of treatment. A fresh product is desirable and if the result is not obtained it may be due to the product being kept in stock for a long period."

The action of renal substance upon the work of the kidneys was first emphasized by the famous Brown-Séquard who in conjunction with d'Arsonval reported a series of experiments which showed that the administration of renal substance postponed uremic manifestations and also prolonged the lives of nephrectomized animals. Numerous other French physicians have made practical application of this and Prof. Teissier, some ten years ago, found that the administration of a glycerin extract of kidney caused a diminution or complete disappearance of certain serious symptoms as the dyspnea, headache and vomiting of severe renal affections.

Of course there is no need to confine the use of renal preparations to eclampsia, in fact McNeile himself says that nephritin is also of great value in the toxemias of pregnancy, and there are numerous reports in comparatively recent medical literature, especially in France, which indicate that this method of treatment is rational in certain renal affections including albuminuria, anuria, uremia, and certain forms of nephritis.

**Hypoadrenia Causes Vomiting in Typhoid Fever.**—According to Khoury (*Presse Med.*, Jan. 6, 1916) the serious vomiting which may occur during the course of typhoid fever, or, later during convalescence from this disease, is a symptom of adrenal insufficiency. The efficacy of adrenalin in cases of this character tends to establish this diagnostic fact.

Khoury gave half a milligram<sup>1</sup> hypodermically in two injections several hours apart or at morning and night. The dose may be increased to 1 mgm., if necessary,

<sup>1</sup> One ounce (30 mils or cc.) of a standard 1:1,000 adrenalin chloride solution contains approximately 30 milligrams of the salt, hence 1/60th of an ounce or eight *minims* will contain approximately half a milligram of adrenalin.

without any inconvenience. It seems best, however, especially if the myocardial muscle is affected, to commence with a quarter of a milligram and increase the amount gradually and progressively.

#### Pituitary Liquid as a Prophylactic Against Prospective Hemorrhage.—

From a purely experimental standpoint it has been shown that following injections of the principle of the posterior lobe of the pituitary, the blood coagulation time is reduced usually from one-third to one-half, and bleeding is controlled.

Kahn (*Ann. Otol. Rhinol. & Laryngol.*, June, 1915) recommends hypodermic injections of pituitary liquid fifteen minutes before the anesthesia is commenced prior to nose and throat surgery. The dose suggested is 12 minims of the standard solution for children and 15 minims for adults. Hemorrhage is greatly reduced, especially during operations upon the turbinate bones.

It may be given with equal prospect of similar benefit in other minor surgical operations as well as in the direct control of bleeding.

**The Dosage of the Animal Extracts.—**With very few exceptions, such as adrenal (medulla), pituitary (infundibulum), and perhaps thyroid, one cannot expect immediate results from the exhibition of the various organotherapeutic extracts. Products made from the glands just mentioned are frequently used in acute conditions, but ordinarily speaking organotherapy is applied principally as an adjunct to the treatment of chronic intractable disorders. There are not a few conditions in which even the extremely active preparations, which are usually given to bring about immediate results, must be given for a moderately long period in order to secure the desired influence.

Generally speaking the hormone-bearing extracts are given with the expectation of augmenting deficient production of the necessary internal secretions, as well as, in a minor degree, of replacing missing hormones. This means that a habit (on the part of the defective endocrinous organs) is to be overcome by the process of homostimulation and this is, naturally, a gradual process.

To accomplish this one should know to what extent there is a deficiency and which of the internal secretory organs is not doing its proper work, but so far as we know at present, it is not always possible to determine this accurately, hence one gives the extracts in small initial doses, increasing them gradually and carefully noting the clinical results. Obviously the dosage must be continued for some time with patience and persistence. It is interesting to note that as the internal secretions are stimulatory substances and do not act by furnishing nutritive material to the cells, they are capable of exerting their specific action in very small quantities; and since this action in most cases means the reestablishment of the deficient services to the body, as a whole, it is clear that the stimuli must be given over some period. Too many failures attributed to organotherapy result from ignorance of this fact. Too often patients are brought to a point where they are just about to "turn the corner" when the physician gives up and tries something else. It should be remembered that in many cases organotherapy is more or less a last resort and when it is tried it should be thoroughly tried.

#### Adrenalin in Asphyxia Neonatorum.—

The fact that adrenalin enables us to duplicate in a degree the well-known sympathico-tonic influence of adrenin upon circulatory muscles as well as the whole sympathetic system (which, of course, includes breathing), is well illustrated in a case reported by Mack (*Jour. A. M. A.*, Aug. 28, 1915). This case is of greater interest because of the unusual manner in which the remedy was administered.

A child was delivered by Cesarian section from a mother just dead from pulmonary embolus. While the delay in performing the operation as well as the care in making the incision was not great, the child gave no sign of life. Artificial respiration (Schultze) by dipping into alternate hot and cold water produced no appreciable result in forty minutes. It occurred to Mack to inject some adrenalin solution 1:1000 (ten minims, we understand) and he did so into the stump of the umbilical cord, carrying the needle well through the abdominal wall. In about two minutes the cord began to pulsate, heart sounds could be

gun to be heard and later felt and within ten minutes (during which artificial respiration was continued) the child was breathing well and crying lustily.

**Thyroid in Nocturnal Enuresis.**—Thyroid gland is one of the most useful remedies for the control of bed-wetting in children. It is not an empirical remedy for its influence has been fully explained by Her toghe and others; and in practically every case where it is indicated there are other evidences of hypothyroidism.

Some years ago Leonard Williams of London published a series of papers which gave abundant clinical proof of the value of this procedure. (See *Lancet*, May 1, 1909; *Brit. Jour. Child. Dis.*, June, 1909; *Polyclinic*, June, 1909; and *Med. Press & Circ.*, May 5, 1909). He very definitely connects nocturnal enuresis with thyroid insufficiency and shows that other evidences of this condition may be discovered as a persistently subnormal temperature; a deficiency in height, weight and, often, mental powers; abnormalities of the skin and especially the hair, etc.

Small doses are best. Williams advises not more than  $\frac{1}{4}$  grain three times a day to start with. Often this is sufficient. It may be continued for some weeks.

Since then a number of confirmatory reports have appeared, among them those of Firth (*Lancet*, Dec. 9, 1911) and McCready (*Penn. Med. Jour.*, Jan. 1911). Firth reports 28 consecutive cases treated with this remedy of which 16 were cured and 12 did not improve. The initial daily dose was  $\frac{1}{4}$  or  $\frac{1}{2}$  a grain and it was given cautiously. The cases which Firth found responded best to this treatment were those in which the enuresis has persisted almost since birth and in which the children were backward. It has also been noted that nervous, excitable children, especially those who cry out in their sleep, have been very responsive to thyroid therapy.

It should be unnecessary to add that if toxemia of any kind is present—bacterial from some hidden nidus of infection as the tonsils, alimentary or parasitic—the cause should be removed as far as possible and the toxemia, especially acidosis of varying degrees, should be neutralized.

**Organotherapy Galactagogues.**—It is now well recognized that lactation is under the control of the hormones and that therapeutic use may be made of this knowledge. As one studies the functional changes brought about by hormone action, one cannot but be struck by the frequency with which a certain physiological influence may be brought about by several factors. Nowhere is this more marked than in the galactogenic function, for a number of the glands of internal secretion exert a very decided influence upon it.

We are more interested in the therapeutic possibilities which may be secured from the practical application of this information, so we will take up briefly what has been done in a clinical, rather than an experimental, way.

Three organotherapy preparations are now frequently used to promote the production of milk.

Mammary substance, because of its homostimulative influence, might be expected to be of some service, and practically it is. Many French investigators have used desiccated mammary gland as a galactagogue and doses of 5 to 10 grains on rising, and at intervals of three hours until four doses have been taken each day, will cause a perceptible influence in the production of milk.

Pituitary extract, preferably from the posterior lobe, is also an excitant of the mammary glands; but it is not yet certain that its influence is other than that of a contractor of the unstriped muscles of the milk ducts. Whether there is a true secretory effect or not, it is well known that expression of the milk is a natural means of facilitating the production of a further supply, and in suitable cases the action of pituitary supplements the mechanical effects of nursing and thus indirectly, at least, acts as a galactagogue. According to Gaines (*Amer. Jour. Physiol.*, Aug. 1915) milking is a stronger excitant than the cannula; nursing is stronger than milking and the direct action of pituitrin, in some cases at least, is stronger than nursing.

In passing it may be well to remember that this musculo-stimulant effect of pituitary is of real service in cases of reduced flow, caked breast and threatened mammary abscess. One mil (c. c.) may be given by injection from one to three times, depending upon the urgency of the case and

the response to the drug. There would be no serious objection to making three injections in a day, and giving a single dose daily thereafter for a week or more. As with all forms of medication each patient is a law unto herself.

Before passing to the third phase of this subject it may be well to make a brief quotation from a paper by Van Zant (*Colo. Medicine*, July 1915): "A point which ought to be emphasized is the value of pituitrin as a galactagogue. In a number of cases in which the mother's milk failed within the first several days after delivery, I have seen a notable increase in its amount through the use of one or two doses, daily, given subcutaneously. Used in this way it would tide the mother over the period of poor milk supply until nature could reassert herself.

Attention has already been called recently to the possibilities of an extract of placenta as a galactagogue. (AMER. MED., Jan. 1916, p. 62). It will be recalled that Bertha Van Hoosen reported very favorably on the influence of 30 grains daily of desiccated bovine placenta in 25 cases. It caused a very marked increase in the amount of milk as well as its quality and it is quite evident that this effect is the result of a true glandular stimulation.

There should be no objection to combining these organotherapeutic preparations, in fact it is quite an advantage, for not only is milk production and elimination stimulated, but the by-effects upon uterine involution, diuresis and muscular tone generally are all useful. Some years ago the writer suggested a combination of these extracts with the extract of cotton seed, a well-known galactagogue the influence of which (in the crude form, of course) is well known in agricultural circles. This combination may properly consist of 5 grains each of mammary and placental substance and 1 grain of the *ext. gossypii seminis*, and 1 grain of posterior pituitary powder may be added if desired. This constitutes one dose and it may be given morning and night (or three times a day if necessary) for several weeks immediately after delivery. Its use as a prophylactic against a poor milk supply, subinvolution, etc., is just as rational as its administration when urgently needed, in fact it would be an excellent plan to use such a combination, or a modification thereof, as a routine postpartum remedy.

Here is a phase of organotherapy which

has not received the attention it deserves, and which will undoubtedly become more popular as its advantages become appreciated.

#### Organotherapy for Backward Children.

—In the past year quite an impetus has been given to the use of pineal extract because of certain reports in the medical and lay press as related in the item in this department entitled "The Possibilities of Pineal Therapy" (AMER. MED., Apr. 1915, p. 255). While reports have come to the writer's attention which were undoubtedly favorable, a number of physicians do not seem to have had the satisfying results that they had anticipated. There is a good explanation for this, for many times pineal insufficiency is not present and the mental mal-development is the result of pituitary or thyroid disorder. This last is by far the most important cause and if no other symptoms of thyroid inadequacy can be seen (though this is the exception) it is always well to attempt thyroid therapy for a period or, better still, to administer a pluriglandular extract. According to E. Bosworth McCready, who conducts an institution for children requiring special attention near Pittsburgh (*N. Y. Med. Jour.*, Feb. 19, 1916, p. 342) this combination may consist of thyroid, thymus, total pituitary, gonads and adrenals. This is given with the expectation that "the benefit is derived through the stimulation of the metabolic processes by bringing into equilibrium the various glands with their common though tangled relationship, rather than through any selective action upon a particular gland." In these cases of hypoplasia and consequent backwardness it is difficult to implicate any one gland, though there are numerous cases in which the symptoms involving one gland are more prominent. McCready believes that with a pluriglandular disorder present that the most obvious treatment should be pluriglandular, and he has found many occasions in which the combination recently mentioned is of much adjunct service.

As a matter of fact pineal therapy is preferably limited to those rare cases in which there are no physical stigmata whatever, and where the only indication is backwardness in the development of mental powers. It is of little value after 14 or 15

years, and most favorable reports have been of children from 5 to 10 years.

**Thromboplastin (Brain Tissue Extract) as a Tonsillar Hemostatic.**—In a recent issue (*AMER. MED.*, Jan. 1916, p. 64) attention was directed to the hemostatic value of cephalin, the diphosphatide extracted by ether from brains. This principle, with slight modification in the production of the remedy, recently has been applied in an extensive way under the supervision of Cronin, chief of the Children's Clinics maintained by the Department of Health of the City of New York. (*Jour. A. M. A.*, Feb. 19, 1916, p. 557).

Altogether 2,036 throat operations were performed following which thromboplastin was used as a local hemostatic with striking results which are tabulated. The procedure consisted simply in applying a pledge of gauze saturated with the preparation, to the cut surface of the tonsillar walls or, in the case of operations for adenoids, to the nasopharyngeal walls.

Bleeding was controlled uniformly and healing seemed to be expedited. "In not a single instance has the operator or nurse been compelled to return to the clinic to care for a bleeder after operation since the use of thromboplastin was made a routine procedure. We now feel that if a case of hemorrhage did occur, any trained nurse could apply the hemostatic." \* \* \* Although thromboplastin solution is used liberally in the throat, and no doubt some of it is swallowed, there has not been any case of illness resulting. Thromboplastin is safe, effective and easily applied."

The preparation of this substance is slightly different from that recently referred to in these columns. According to Hess (*Jour. A. M. A.*, Apr. 24, 1915, p. 1395) the method is as follows: Fresh ox brains are stripped of their membranes and washed. They are then passed through a meat chopper three times and mixed with an equal volume of normal salt solution. This is left in a refrigerator for 48 hours, and then filtered through cheese cloth (twice). This cloudy solution is then diluted with one-half its volume of salt solution and tricresol (0.3%) is added as a preservative.

It appears to keep well, as aerobic and

anaerobic cultures have repeatedly been found sterile and its hemostatic potency is retained for many months.

### PRACTICAL POINTS.

**Noises in the ears** are a frequent accompaniment of thyroid insufficiency.—Hertoghe.

**Mental depression** from which many women suffer at the menopause is often relieved by small doses of thyroid.

**Headache**, more intense in the morning on rising and disappearing later in the day, should suggest a search for other signs of thyroid inadequacy.

**A sense of restlessness**, both physical and mental, is characteristic and constant even in the early and slight cases of Graves's disease.—L. Williams.

**Vomiting in Graves's Disease.**—George R. Murray, the originator of thyroid therapy, remarks that he has found that the persistent vomiting not infrequent in Graves's disease will sometimes respond better to pituitary liquid than to any other remedy.

**Chronic Diarrhea.**—"Every chronic diarrhea in a neurotic subject should be under suspicion of having its origin in a disturbance of thyroid function, and careful search should be made for the characteristic signs associated with hyperfunction of the gland." Roberts, *A. J. M. Sci.*, Feb., 1916.

**The Advance of Organotherapy.**—"Treatment based on the internal secretions is, in some instances, positively startling in its results, and bids fair to revolutionize our methods in several lines of practice; it is also eminently satisfying from a scientific viewpoint, being far removed from our old hesitating empiricism."—Editorial, *N. Y. Med. J.*, Feb. 26, 1916.

**Sanitary Sand Piles.**—With the incidence of balmy weather, though the March winds are still upon us, preparations are being made throughout the country for the installation of adequate recreational facilities for children. As an essential part of the resources of parks and playgrounds, sand piles have been recognized as of particular value for the use of



the younger children. While affording an opportunity for constructive play, though not always with the valuable results depicted by Stanley Hall in his Story of a Sand Pile, the healthful side of the pile of sand has not received commensurate attention.

The placing of sand piles is largely a question of convenience of location and is not determined entirely by conditions of shade or sunlight. As a general rule, however, in the interest of the children, the sand piles are protected by a tent, a shed, or a large umbrella. The material most commonly used is building sand, though the far more preferable white quartz sand is occasionally employed.

It is obvious that there are many difficulties in safeguarding sand piles from pollution by the discharges of children as well as by the excretory products of stray animals. Inasmuch as the vast majority of infectious diseases are transmitted through contamination by bacteria cast off from the nose and throat as well as the excretory passages it is of immense hygienic value to eliminate, in so far as may be possible, every chance of infection through the medium of the sand pile.

In this connection the study of Mannheimer (*American Journal of Public Health*, August, 1915) is worthy of com-

ment at this particular time. His investigations indicated that the sand thus used was frequently utilized without renewal for periods of from one day to two months. The bacterial content per gram of sand varied from 14,000 to 710,000 while control samples averaged 6,000 to 15,000. Tests were also made to indicate the period of time that diphtheria and typhoid cultures could live in sand piles exposed to ordinary light at laboratory temperatures. A considerable number of these bacilli were found living and active at the end of a week.

Possibly, the question of disinfection of sand piles may appear to make a mountain out of a sand hill. In so far as communities provide recreational facilities for children, they should assume a full measure of responsibility for the provision of the most sanitary and healthful forms of apparatus. If white quartz sand, for example, dries out more rapidly than common building sand, it should be used by preference. If contamination by stray animals may be prevented by screening the sand piles during the night such procedure should be universal. If children while at play are wont to urinate or defecate in the sand pile such conduct should be prohibited. In fact, in so far as possible youngsters with soiled napkins should not be permitted to sit in the sand without some protective covering for the sand itself.

Inasmuch as a solution of calcium hypochlorite containing one part of available chlorine to one thousand parts of water is a cheap and satisfactory germicidal solution, its nightly use should be routine. The amount necessary to sterilize a sand pile is equivalent to one-thirtieth the volume of sand.

These seemingly trifling matters in general sanitation, in the aggregate, assume considerable importance. Until a few

years ago the disinfection of swimming pools was scarcely dreamed of except in high class modern gymnasiums where the general intelligence of the membership had created high esthetic standards. Today a demand for the sterilization of swimming pools is general and dependence is no longer placed upon the mere renewal of the water supply. It is probable that similarly attention to the sanitation of sand piles will gain force. The parks, playgrounds, school yards and similar places of child recreation will be supplied with sand piles fit for the use of children and safeguarded through intelligent disinfection.

**Safe Sausage.**—The sausage industry commercially is worth more than \$25,000,000 to this country. Despite the fact that



sausages play such an important part in the dietary of all types of persons in the community, there is apparently a dearth of investigation regarding its worth or safety as a food product. Popular traditions give sausage an un-

savory reputation. Horse meat, cat meat, condemned pork, and the flesh of tuberculous animals are hinted at as frequent sources of the meat supply entering into the manufacture of sausages. Regardless of the truth of such unpleasant rumors, it is not to be denied that there is a much larger record of gastro-intestinal accidents following the ingestion of sausages than of any other form of meat product.

From the standpoint of food value pork sausages, which consist of protein 12.8 per cent., fat 45.4 per cent., provide 2,155 calories per pound, while bologna, containing 18.6 per cent. of protein and 18.2 per cent. of fat, yields 1,115 calories per pound. Economically considered, it is obvious that dietetic needs in protein and fat may thus be secured at comparatively low prices. Fresh pork sausages, however, must be consumed as soon after manufacture as possible because deterioration sets in very quickly and is not wholly prevented through cold storage or sudden freezing. There is far greater safety in the dry sausages as they are from cured meats.

The dangers of sausage eating are not due however to the limitations in carbohydrate content nor merely to the character of the meat from which they are made. Fortunately very few fresh sausages are eaten in an uncooked state and the boiling process serves to decrease bacterial development and to destroy many of the contaminating organisms.

The study of bacteria in sausage reveals immense variations. However, even those sausages possessing the largest bacterial content are not necessarily the most dangerous. The variety of the organism is of greater significance than mere numbers. Weinzirl and Newton (*American Journal of Public Health*, 1914, 4, p. 413) suggest that 10,000,000 bacteria per gram be regarded as a standard for the sanitary bacterial content of meat. If, however, such large figures were to be assumed to be safe for sausages without a qualitative investigation as to the nature of the organisms, sausages containing under 100,000 bacteria would be deemed safe, even though they contain *B. coli*, *B. paracoli*, *B. fecalis* and similar other organisms of intestinal origin.

*B. paratyphosus* and *B. enteritidis* have been reported as occurring in sausages, possibly as a result of uncleanly methods in manufacturing. It is undeniable that *B. coli* occur almost constantly in sausages. The study of William F. Cary (*American Journal of Public Health*, February, 1916) suggests very forcibly that the occurrence of these bacteria in a large measure is due to the infective influence of the sausage casings. As a result of his investigations he recovered many intestinal organisms whose presence may be due to errors in manufacture, technic, or possibly the utilization of meats unfit for human consumption.

Regardless of the type of bacteria, adequate cooking destroys most of the bacteria and thus safeguards the consumer from the dangers possibly lurking in the fresh or uncooked foodstuffs.

Undoubtedly, the cheapness of meat products like sausage is accountable for its widespread use but the part that such bacteria containing foodstuffs plays in the development of gastro-intestinal disturbances is practically unknown. It is only an epidemic of food poisoning that attracts attention and in this particular certainly

sausage has played its part. The very term "botulism" is derived from the Latin name for sausage. The protein toxins developed by the *Bacillus botulinus*, which is rare in this country, produce a severe poisoning not infrequently leading to fatality. However, different organisms of the *proteus* group are also responsible for severe toxemias resulting in death. Silberschmidt (*Zeitzchr. f. Hyg. u. Infektionskrankh.*, vol. XXX., p. 328) reported a group poisoning of fifty persons where the *proteus vulgaris* was the infecting organism and sausages its distributor.

It is not however, the occurrence of these marked outbreaks of bacterial infection or botulism that merit the principal consideration. Undoubtedly, there are frequent instances of family infection where only one or two persons may be involved which do not come to light. The diagnosis is ptomaine poisoning and little attention is given as to the possible etiological factor. It would be interesting to know, if it were possible, the actual influence of improperly cooked sausage upon human beings, particularly the immature whose powers of resistance are insufficient to guarantee adequate protection against bacterial assault. The sterilization of sausages by heat does not necessarily destroy the toxins already formed.

Experience with the bacterial content of milk has given rise to a wide campaign of information regarding the importance of safeguarding this particular food so necessary for infants and children. Inasmuch as sausages are utilized for the feeding of children, their manufacture should be carefully guarded and there is every reason to believe that this is being done. Careful regulations should be established as to the variety and character of the meat entering into sausage making. A pure food sausage is as important as any other form of foodstuff. The safety thus afforded is more vital than the question of protection against adulteration with starch which at least possesses some food value without toxic hazard. There should be strict regulation regarding the period of time that fresh sausage may be offered for sale and restrictions placed upon the sanitary conditions under which they are handled before getting into the hands of the consumers. For the final protection of the consumers, there should be disseminated information as

to the importance of thorough cooking and the unwisdom of making the sausage part of children's dietary.

#### The Importance of the Care of the Teeth.—The dentist is coming into his own, so to speak, for never before has

the necessity for having good clean sound teeth been so impressed upon the minds of the medical profession and the public at large as it has been recently. Oral sepsis is now held to be responsible, both directly and indirectly, for many conditions of ill health and disease, and it is at last being recognized on all sides that the state of the teeth and mouth is a fair index of the general health.

A remarkable object lesson in this direction has been provided by the war in Europe. The exigencies of a soldier's life and especially the conditions of such a campaign as is going on at the present time render it incumbent that soldiers should be possessed of teeth that not only will allow them to thoroughly masticate the food that is put before them, but that are kept as free from decay and infection as possible. In fact, a soldier whose teeth are defective has been shown to be, in the majority of instances, unfit to serve in the army. Thus, as one important lesson of the war, has come in Great Britain and France a somewhat tardy recognition that a skilled dental service is one of the paramount needs in maintaining the efficiency of an army. Experience has shown that the dentist is needed not only to repair the defects of the soldier's teeth so that he may be able to eat well and consequently to fight well, but also in cases of jaw injuries, where proper construction together with satisfactory plastic results are impossible without the aid of skilled dental technique. At a meeting of the Eastern Medical Society held at the Breevort House, New York, on February 11, 1916, Dr. W. Seaman Bainbridge in an address dealing with some of the happenings at the front witnessed by himself, showed on the screen some really wonderful examples of jaw reconstruction and plastic surgery performed at the Ameri-

can Hospital in Paris by American surgeons and dentists. Indeed, in this present war, in which head injuries so largely predominate—on the French front at least—it has become apparent that the aid of the dentist is required quite as often as that of the medical man.

The French medical military authorities have accordingly become so greatly impressed with the value, or rather with the necessity, of the dentist in war that a dental service has been made a definitely organized department in the French army. One thousand qualified dentists will be gazetted adjutants, five hundred to serve at the front and five hundred to remain in the depots, there to be associated and work in conjunction with the army surgeons. With each group of stretcher bearers there will be provided a mobile dental staff, the members of which will attend to the men's teeth in their cantonments. Dental clinics moreover, are to be attached to each hospital centre, and a sufficiency of mechanical institutes provided up and down the country to meet all needs for artificial teeth and appliances.

American dentists have always ranked high in European centers and it is gratifying to note that the American Hospital in Paris at the Lycée Pasteur has been a pioneer in giving proper attention to dental requirements.

A further recent decree in France authorizes the Ministry of Marine to recruit a staff of dental surgeons to be attached to the Naval Medical Service during the war.

The British military authorities, tardy as usual in adopting innovations, have been slow in organizing a dental service for their army and navy, but public opinion day by day in Great Britain is becoming more and more alive to the necessity for the proper dental treatment of the troops. Sooner or later the storm will break and then we may expect to see an efficient service instituted. As the *Lancet* says in a leading article published Feb. 12, 1916, "The modern medical man realizes that the properly trained dental surgeon's opinion is worthy of respect—and that it is impossible without special knowledge to deal rationally with the problems which must arise in connection with dentistry." Everything points then to the view that a dental service is an indispensable adjunct of an army, especially of an army in the field, and without such

service it is certain that the efficiency of a fighting force cannot be maintained at its highest point.

It is gratifying to note that the United States officials are alive to the importance of dental care, for an essential detail of the punitive expedition into Mexico was a fully equipped dental outfit under the charge of U. S. Army dental surgeons. The benefits are sure to be soon manifested, for the conditions, climatic and otherwise, our boys are bound to encounter, will tend to aggravate the slightest trouble with the teeth, and add greatly to their suffering and discomfort. Prompt and effective dental treatment will eliminate all this so far as the teeth are concerned, and to the extent that the troops are thus kept more healthy and enduring, the dentists with the expedition may play a more prominent part than will be generally realized in the ultimate capture of Villa.

**Child Welfare and the Health of Children.**—In all parts of the world, that is, up to the time that the war engrossed the attention of the big European countries, the supreme importance of conserving infant life and of bringing up children in as healthy a way as possible was fully recognized. Of course, it is still recognized when people have time to think of it, and when the war is finished the problem will be more insistent than before with several factors added to make it more complex and difficult of solution.



The boy is father of the man and unless the children of a country are reared so as to grow up to healthy vigorous men or women, a race and nation must sooner or later wither and decay. In the United States it is only within a comparatively recent period that the question has been regarded with the seriousness that its importance deserves. America has lagged far behind some of the European countries in this respect, but it is gratifying to know that now she is endeavoring to make up for lost time. The child welfare campaign is well under way and the results as shown by the recent Baby Welfare Week held all over the country, bid fair to be eminently satisfactory. With

regard to the health of infants and young children, the milk question always looms large before us. While it is freely acknowledged that infants should always when possible be fed at the breast, it is also realized that for many reasons this is not done nearly as frequently as is desirable. Moreover even after the age of infancy, milk takes its place for some time as the staple diet of a properly fed child. Therefore, the problem of a good clean milk supply is continually being borne in upon us. However, there is no space here to discuss the milk question except to refer to the excellent social service work being done by nurses of the Infants' Milk Stations of the Bureau of Child Hygiene of New York. Indeed the social service performed by nurses of the New York Health Department has been and is of incalculable value and the example of the Metropolitan Health Service might be followed with advantage throughout this country.

It may be pointed out that in cities like New York and Chicago, of which a goodly proportion of the population consists of immigrants of a somewhat ignorant type and whose views on hygiene and sanitation are of the most elementary character, the scope of child welfare workers is practically unlimited. The means by which children in such centres can be brought up as decent healthy citizens, mainly hinges on educative measures. They must be taught, and their parents must be taught, how to live, and the best way, perhaps the only effective way, of imparting such knowledge is by going into their homes and giving them practical instruction.

The child welfare movement is worthy of all encouragement and support. Probably no other single movement has greater potentialities, or can do more to increase and strengthen national vitality than that concerned with child hygiene and its manifold phases. Truly on the welfare of the children depends the future of the nation.

## CORRESPONDENCE

### COERCION, NOT CORRECTION, IN ALCOHOL BILL.

To the Editor

AMERICAN MEDICINE,  
New York City.

Coercion, not correction, is the real purpose of Assembly Bill No. 776 (Section 249-F of the Public Health Law) introduced by Senator Boylan and Assemblyman Bloch, for by its terms:—

"It shall be unlawful for any person to sell, offer for sale, give away or dispense any compound or preparation sold or intended to be used as a specific, remedy, treatment or cure for any bodily disease or illness which shall contain more than ten per centum of common or Ethyl Alcohol in proportion to all other substances therein contained, except upon the written prescription of a duly licensed physician, provided that the provisions of this article shall not apply to liniments and ointments for external use only. Any violation of this section shall be a misdemeanor."

Under this bill if it becomes a law no citizen of this State and no dweller therein shall have the right to purchase at his druggist's or elsewhere, without securing a doctor's prescription any quantity whatsoever of such simple household remedies as sweet spirits of nitre (92% alcohol) for administration to his child who is feverish from an approaching cold or a past indulgence in too much sweets or the presence of one of the passing ills of childhood. If a baby be constipated a mother may not give it a teaspoonful of aromatic fluid extract of cascara sagrada (30% alcohol) unless she consults her physician, secures his written prescription and pays his fee; if a housewife wishes to use some essence of pepsin (18% alcohol) to make whey or junket for a delicate child or adult, she must pause to consider that the initial cost of the milk must have added to it a physician's office fee; if she would rub some tincture of myrrh (90% alcohol) on her teething baby's tender gums she must rob her family of some comfort to employ a doctor to help her buy

**Orchitis.**—If you have a case of orchitis (*Med. Standard*), suspend carefully, apply guaiacol in camphorated oil, in the proportion of a dram to the pint, bandage snugly, and give anemonin in granule form internally.

a few pennies' worth of this medicine; if an active child sustain a pin scratch his mother may as well make a surgical case of it at once for it will not cost her any more than it would to get a doctor's prescription to enable her to buy a few ounces of one of the simple antiseptics (25% alcohol) with which to cleanse the surface; if the house-wife wishes to bake a cake she may not flavor it with essence of vanilla (61% alcohol) unless her doctor helps her buy it; a hundred other remedies and household necessities will suggest themselves to the readers of this communication and because they contain more than ten per cent. of alcohol they may not be purchased without a written prescription!!

Now what is back of all this nonsense? Some good people who abhor the Demon Rum honestly believe that this law has for its purpose the limitation of the use of alcohol by their neighbors, but if they will give it a little serious thought they will realize that to get a man's sized drink of alcohol from sweet spirits of nitre would require sufficient to precipitate an acute attack of kidney disease; even a moderate drinker would have a violent and painful diarrhea from sufficient fluid extract of cascara to "wet his whistle" and if he used tincture of myrrh the least effect would be to rob him of his sense of taste for a month or more; if a man chose essence of pepsin as his tipple it would very promptly put his digestive apparatus out of commission. Surely the use of these "preparations" containing more than 10% alcohol would help rather than hinder the cause of temperance and we must look further for a reason for such absurd legislation. Did the authors seek to limit the sale of proprietary remedies which contain more than 10% of alcohol?—perhaps. Let us hope that no sane legislature will countenance such a wholesale and blanket indictment of chemical products; I hold no brief for the manufacturing chemists of this country but I do know that many of our leading and most scientific medical men exercise their right to use the best among the proprietary remedies for the benefit of their patients and do not hesitate to instruct their patients to buy these preparations under the trade name and at commercial rather than prescription prices, and who shall criticise them for manifesting this consideration for their

patients' pocketbooks? Why should the legislature assume the right of censor of the common decencies between men and their physicians?

I wonder if the origin of this bill does not reflect the subtle hand of the mercenary in the practice of medicine who is beginning to find that his prostitution of the sacred calling for gain has begun to reach the people, who from bitter experience, have learned to use the good things of medicine for the relief of simple ills and will no longer submit to be victimized by that type of physician who resembles the family physician of other days as the coyote resembles the collie or the hawk resembles the hen; if this be so then in the name of honest medicine and for the love of honest, conscientious and considerate physicians let us encourage the public to practice preventive medicine in the home with such simple remedies as I have mentioned; let us kill these bills and, lest we disappoint those good people who have been deceived into supporting them let us prepare some bills which will make it impossible for a bottle of whiskey or cocktails, purchased at a corner grocery, to change its label and become a bottle of olives or a pound of coffee on the charge account book of the breadwinner. Thus we will strike at one of the most serious causes for the increase in the use of alcohol among women and children; we must understand that when a man wants a drink he buys it, as such, at a grocery, a saloon, a cafe or a hotel; he does not have to pay fancy prices for a mess of medicinal stuff, simple or proprietary, in order to extract from it enough alcohol to satisfy his needs; when will these "reformers" realize that the responsibilities placed upon an employer by the Compensation Law has done more for the cause of temperance than all the direct prohibitory legislation that has ever been passed, for men are drinking less in these days since they want to hold their jobs and know an employer is not taking any chances on a drunken employee.

If this bill becomes a law a citizen of this State who is a manufacturing chemist producing a proprietary medicine containing, say, 15% of alcohol will be well within his rights if he procures the arrest of a druggist for selling a teaspoonful of fluid extract of cascara without a prescription and technically the druggist will be guilty of

a misdemeanor and subject to a fine of not more than \$500, or imprisonment for not more than one year, or both, and under a subdivision of Sec. 249 of the Public Health Law may be deprived of his right to exercise his calling. The same punishment may be meted out to your beloved family doctor if he gives you a sample bottle of some proprietary remedy for its value as a tonic. If the 1350 bills which were introduced into the legislature from Jan. 1 to March 15, have no more reason for being than has Assembly Bill 776 we would be better off if we had biennial or quadrennial sessions; then at least we would have more law and *less laws*.

Respectfully yours,  
JOHN J. A. O'REILLY, M. D.



**The Allen or "Starvation" Treatment for Diabetes.**—So much interest has been created in the treatment being used at the Rockefeller Institute under the direction of Dr. Allen that the following description by Dr. J. T. Halsey (*New Orleans Med. and Surg. Jour.*, Jan., 1916) is very timely. Its fundamental details are:

1. Inauguration of treatment by a period of absolute fasting, lasting ordinarily from one to four or five days (in extreme cases for as long as ten days).

2. Underfeeding, i. e., giving much less than is ordinarily considered an adequate ration, for a period of variable length following the period of absolute fasting.

3. The very careful determination of, and avoidance of, exceeding the tolerance of the patient, not only for carbohydrates and protein (as under former methods of treatment), but also for fats, generally looked upon not only as harmless, but as actually beneficial to the diabetic, whether of mild or severe degree.

4. Careful avoidance of an increase of weight unless the patient be decidedly underweight.

When called upon to adopt so radical a departure from tried and accepted methods, it is only right to ask what are the advantages claimed or demonstrated, which may be secured by its adoption. Very briefly they are as follows:

(a) More rapid and certain abolition of the glycosuria, and more important still, of its cause, the glycemia.

(b) More rapid and more successful building up of the carbohydrate tolerance or, in other words, the ability to combust carbohydrates.

(c) Prompt and complete relief of the acidosis or acidemia, and, as a result, prevention of or, if present, the clearing up of that most serious of the results of diabetes, diabetic coma.

If we will do this, we will all agree that it is a treatment worth while.

*Inaugural Fast.*—Taking up the above in turn, the inaugural fast may first be considered in detail. In the great majority of any but the most severe cases this need not be for longer than from two to four days. Generally speaking, its duration should be about twenty-four hours longer than is necessary to secure a disappearance of sugar from the urine and the disappearance or marked diminution of the acidemia (if such be present), as evidenced by the reaction of the urine and the lessening of the ferric chlorid reaction. If necessary to prolong the fasting for more than two days, it is well to give about two ounces of beef broth four to six times in twenty-four hours.

It is, however, not yet possible to dogmatize as to the length of the initial fast. In some especially obstinate cases it will be best to interrupt it by a period of careful feeding, and after a variable length of time, again fast the patient, when, as a rule, one or two days of abstinence from food will lead to a complete disappearance of the glycosuria or acidemia.

During the fasting periods the patients should drink freely of water or weak tea (no sugar or milk), and, if acidosis be present, take from four to eight ounces of whisky in divided doses. Feeble patients will bear these fasts best if kept in bed well covered and, in cool weather, surrounded by hot water bottles. It is most surprising and gratifying to see, in even desperately sick patients, an increase in strength result from a fast of several days' duration. While we can confidently expect that the acidosis, if present, will quickly diminish in intensity, alkalies should be given freely at the commencement of the fast and the dosage lessened as the urine becomes alkaline. Even though no acidosis be present, it is probably wiser to give alkalies when starving a diabetic for the first time.

That glycosuria should be abolished by absolute fasting is, in the light of former experience, not in the least surprising, for to some extent absolute or partial starvation for short periods has been a part of our treatment of certain cases, but that acidosis can be lessened and abolished by this measure is absolutely in opposition to what we have all been accustomed to believe. Did we not fear to too suddenly reduce the carbohydrates for fear of causing this dreaded acidosis, and did we not all believe that, when coma threatened, we should increase the ration, especially that of carbohydrates? Moreover, we knew that in the healthy individual fasting or even underfeeding was regularly followed by the appearance of acetone and diacetic acid in the urine, as evidences of the development of an acidemia. And yet it is true that in the diabetic an acidosis of high intensity may be lessened or abolished by a sufficiently prolonged fast. This demonstration of the diabetic's paradoxical reaction to fasting is the most surprising as well as one of the most important of Allen's contributions to our knowledge of diabetic physiology and therapy.

*Period of Underfeeding. Carbohydrate.*—Following the period of fasting, feeding should be inaugurated by giving small but gradually increasing amounts of five per cent vegetables (see table), which, in especially severe cases, should be twice or thrice boiled in order to still further reduce their starch content. Six to ten ounces may be given the first day; then, if glycosuria does not return, these amounts may be increased by three to four ounces (90 to 120 gms.) a day until the daily ration reaches sixteen to twenty ounces (500 to 600 gms.). After this the amounts should be increased daily by about three ounces (100 gms.) of the 5 per cent vegetables or correspondingly smaller amounts of 10, 15, and 20 per cent vegetables, 5 and 10 per cent fruits, and later, in mild cases, such foods as bread and cereals, until the patient is taking about one ounce of carbohydrate to twenty pounds of body weight (3.0 gms. per kilo). During this period the urine should be tested for sugar and also diacetic acid, using 24-hour or better 12 or 8-hour specimens. Reappearance of sugar or diacetic acid requires stopping all food for twenty-four hours and resuming feeding with about half as liberal a ration.

*Proteids.*—When there has been no glycosuria for two days, two or three eggs may be given, and, if no bad results ensue, these may be increased two each day until six are taken daily, or meat may be given, increasing the amount by about two ounces (60 gms.) daily until the patient is taking about 1.6 ounce of protein (about 2-3 ounce of meat) per 10 pounds body weight (1.0 gm. protein per kilo) daily. Reappearance of sugar or reappearance or increase of diacetic acid calls for the same measures as if caused by too much carbohydrates. In severe cases with little or no carbohydrate tolerance, Joslin advises that only about three-quarters of this ration be given. In mild cases fifty per cent more (1.5 gm. per kilo) may be given later if desirable.

*Fat Tolerance.*—Soon after protein are given small amounts of fats ( $\frac{1}{2}$  to 1 oz.—15.0 to 30.0 gm.) may be given in the form of butter or bacon (3 or 4 oz. of broiled bacon=1 oz. of fat). This should be increased very slowly or not at all until the patient is getting his necessary protein ration. Then the fat may be increased by  $\frac{1}{2}$  to 1 oz. (15.0 to 30.0 gms.) daily until the patient holds his weight or is receiving about two-thirds oz. per 10 lbs. body weight (4.0 gm. per kilo).

In contradiction to accepted views, Allen emphasizes the fact that a too liberal fat ration may lead to the reappearance of sugar or diacetic acid in the urine, and he insists that the failure to recognize this point has been a large factor in the failure of treatment in many diabetics.

Not only must the patient remain within his tolerance for each type of food, carbohydrates, protein, and fats, but the physician must see to it that the total energy value of the diet shall not exceed the patient's tolerance. The reason for this appears to be as follows:

The diabetic organism (except perhaps in extremely rare instances) retains in varying degrees the power to combust some carbohydrate and will do this unless it can satisfy its needs

by the combustion of other food materials, such as either proteins or fats. We must, therefore, constantly give the diabetic only enough food to barely cover his needs, and so, as it were, force to burn carbohydrates in place of other material. Whether this hypothesis be true or not, diacetic acid or both may be made to reappear in the urine by feeding too large amounts of fats.

*Control of Weight.*—In diabetic patients we have been accustomed to consider a gain in weight as a good sign and as something to be desired. Here, again, Allen's view is opposed to that generally accepted. Unless the patient is decidedly under his proper weight (which does not necessarily mean his former weight), he believes that a gain in weight is distinctly undesirable and fraught with danger to the patient. As a rough general rule, he advises that the patient be brought back to a weight ten to fifteen pounds under his former figure, if this represents a fair degree of nutrition, while in obese cases he considers it best to reduce the weight, at times very decidedly.

In this connection it is absolutely impossible to dogmatize, for each case will be to a large extent an individual problem. The idea underlying the principle of limiting the weight of the patient is that both theory and experience indicate that the weakened pancreas is often able to handle the carbohydrate function only for a body of a certain limited weight, and that it breaks down and becomes inefficient when called on to do the work necessary for the maintenance of a larger one.

*Periodical Fast Days.*—If the carbohydrate tolerance is very low (below 2-3 oz. or 20.0 gms. of carbohydrate), a weekly fast for 24 hours must be insisted on. By less severe cases, with a tolerance up to 2 oz. (60.0 gm.), one-half the usual ration may be taken every seventh day, but on this day carbohydrates are allowed only in the form of 5 per cent vegetables, and in amounts equaling one-half the usual carbohydrate ration. With higher tolerance the only limitation on the "fast" days need be the limitation of the carbohydrates to 5 per cent vegetables.

These fasting or partly fasting days are of great importance and benefit to the patient for two reasons. One is that they build up and protect the tolerance. The other is that they serve to keep the patient cognizant of the necessity of care in his diet.

Those individuals who develop a fairly high tolerance for carbohydrates may finally work back to a relatively liberal diet, one to which they may adhere without much self-denial. Still "once a true diabetic, always a potential diabetic," would appear to be a good "confessio credis" in this field of practice. Such patients should, if possible, be persuaded that, while they are in one sense cured, the price they must pay for a permanent cure is the persistence of care in eating, so as to take, as far as may be necessary, the strain off their permanently weakened power of burning up sugar and starch. They must also be convinced that any return to glycosuria is an imperative command to immediately fast for at least twenty-four hours and to again undergo a period of care-

ful dieting, which fortunately will almost invariably be far less trying than the original one.

The necessary limitations of space make it impossible to more than indicate the general principles and a few of the details of this treatment. For further enlightenment it will be necessary to refer to some, at least, of the articles enumerated in the accompanying bibliography. Among these Joslin's first article should prove especially helpful, while the little booklet of Hill and Sherrick, containing a number of diets, should prove useful in carrying out the dieting.

The success or failure in any case will depend on the willingness of the physician to devote the necessary time and care to seeing that the essential details are attended to properly, and also on his ability to convince patients that "all this fuss" is worth while. Good results will in no case be obtained without considerable cost of time and trouble to the physician and an equal or greater cost of patience and self-denial on the part of the patient, but the results will be worth while. Grave cases should, if possible be treated in well-equipped hospitals and by those who have had experience in handling such cases, but mild or emergency cases should and can be treated by any competent physician. There is one class of case in which the writer would especially urge the trial of Allen's plan. This is in diabetics with a surgical complication, such as gangrene, carbuncle or septic infection. Up to the present nothing, as far as the writer knows, has been published about such cases, but from personal communications he knows that in such conditions this treatment has proved of striking value. Recently he has seen, with Dr. F. W. Parham, most gratifying results from its employment in a severe diabetic with extensive gangrene and still more extensive accompanying cellulitis.

In conclusion, it will, I think, interest physicians to learn that this valuable and important stride in therapy is the direct result of, and could not have been accomplished without, animal experimentation. Everything new and valuable brought forth by Dr. Allen came to him through the animal experiments carried out by him during a number of years, and everything tried out on his human patients was first tried out and its value demonstrated on dogs in which he had induced diabetes of varying intensity.

Some of the accompanying tables are condensed and somewhat altered from Joslin's article:

**Carbohydrate-free foods.**—Meats, fish, broth, gelatine, eggs, butter, oil, coffee and tea. Substitute for sugar, saccharin, which most patients do not like.

**Vegetables 5 per cent.**—Asparagus, brussels sprouts, cabbage, cauliflower, egg plants, cucumbers, kohlrabi, lettuce, pumpkin, radishes, rhubarb, spinach, sauer-kraut, tomatoes.

**Vegetables 10 per cent.**—Beets, carrots, mushrooms, okra, onions, squash, turnips.

**Vegetables 15 per cent.**—Artichokes, lima beans (canned), parsnips, peas (green).

**Vegetables 20 per cent.**—Beans (baked), corn (green), macaroni (boiled), potatoes, rice boiled.

**Fruits 5 per cent.**—Olives (20 per cent fat), grapefruit.

**Fruits 10 per cent.**—Blackberries, cranberries, lemons, oranges, peaches, strawberries.

**Fruits 20 per cent.**—Bananas, plums.

With vegetables of the 5 per cent group, reckon only about 3 per cent actually available and for 10 per cent group about 6 per cent.

**Miscellaneous.**—Meat contains about 20 to 25 per cent of proteid when cooked and 5 to 25 per cent of fat, broiled bacon about 8 per cent proteid and 30 per cent fat, fish about 20 per cent proteid and 10 to 25 per cent fat, an average size egg 5 grms. or 1-6 oz. proteid and nearly as much fat, bread about 50 per cent starch, grits (cooked) about 20 per cent starch, cornbread about 50 per cent starch, butter 85 per cent fat, milk 3 1/4 per cent proteid and fat and 5 per cent sugar, gravity cream 20 per cent fat.

Bread substitutes usually contain almost as much starch as ordinary bread. Huntley and Palmer's Akoll biscuits contain only a small amount of starch and are well liked by many patients. Hermann Barker, 433 Broadway, Somerville, Mass., supplies several gluten flours of different carbohydrate content. Casoid flour (Thos. Leeming & Co., N. Y.) contains 85 per cent proteid, but no starch. The writer has found that some patients get much satisfaction out of bran breads, made with equal weight of bran and flour and containing approximately 25 per cent of starch. Hoyt's Dainty Fluffs No. 1, containing less than 10 per cent starch and about 80 per cent proteid, and Dainty Fluffs No. 2, containing about 25 per cent starch, may be obtained from Pure Gluten Food Company, 90 W. Broadway, N. Y.

A sample diet for a severe diabetic weighing 60 kilograms (130 lbs.) follows (Joslin):

Food—	—Quantity—		
	in grams	in ounces	Calories
Carbohydrates .....	10	1/3	40
Proteid .....	75	2.5	300
Fats .....	150	5	1350
Alcohol .....	15	1/2	105
Total .....			1795

**Rational Treatment of Chronic Seminal Vesiculitis.**—The profession still seems slow, says an editorial writer in the *Medical Fortnightly* (March, 1916), in adopting the excellent surgical method originated by Belfield of Chicago, of radically treating chronic purulent affections of the seminal vesicles. The older methods of "attempted" massage together with deep urethral irrigations, supplemented by the use of stock or autogenous vaccines are woefully inadequate. Patients are still going the rounds of the men doing genito-urinary and general practice who treat gonorrhea and its complications and still being handled by the unsuccessful methods of the past. Just as it is with many procedures in medicine that the rank and file are either too lazy or too prejudiced to try out, so it is with the method of treatment of these cases by means of surgical incision of the vas

and deep and forcible injections of silver salts into the passages and vesicles; these patients are denied the opportunity of having their cases handled along modern and up-to-date lines. The operation is so simple and the result so wonderfully successful that the physician who denies his patient the chance of recovery by Belfield's operation is doing him (and also himself) a great injustice.

The operation as simply and quickly performed by Belfield of Chicago, Jost of St. Louis and others, is to inject cocaine over the point to be operated, namely, at the upper part of the attachment of the scrotum, picking up the cord with an instrument for skin transfixation not unlike a sharp aneurism needle, quickly incising into the cord, separation of the vas from the vessels of the cord, rubbing off the outer coat of the vas, making a small nick in the anterior wall, inserting a needle attached to a glass syringe, point upward, injecting from 10 to 20 cubic centimeters of argyrol in strong solution or the same amount of protargol, slipping out the needle and suturing the skin incision. The operation should be bilateral. The patient will often complain of a burning in the deep urethra during the time of the injection, indicating that the antiseptic fluid has traversed the entire route of the seminal canals down into the urethra at the utricle. The bladder will show argyrol—or protargol—stained urine. This operation in no way compromises the patient's ability to attend to his regular work, the skin incision is healed in a few days and what is best of all, his "morning drop" that his numerous physicians have been "trying to cure" for from five to twenty years is cured in a few days. If you don't believe it, try it out for yourself on a series of cases. This kind of work is very much like the problems of syphilis; cases are so legion that it doesn't take long to prove or disprove an assertion.

There are certain misconceptions that many physicians will have to give up and one is, that they can cure these cases without resorting to drainage along surgical nature. *Vaccines and irrigations are excellent supplementary agents but per se cure very few if any cases of chronic seminal vesiculitis.*

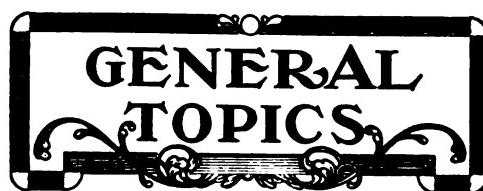
for books is made to publishers, authors, and libraries all over the country. An appeal is also made for money, which is needed to help Belgian scholars and artists now and to carry on the activities of the committee. A huge reconstruction fund, to be used for educational purposes only, is also to be sent to the Belgian people after the war is over. The membership of the committee is made up of leading men in America, among them being the presidents or chancellors of the following universities: Johns Hopkins, Princeton, Michigan, Missouri, Leland Stanford, Pennsylvania, George Washington, State of New York, and Nebraska. Dr. George Sarton, 309 Wilkins Building, Washington, D. C., is secretary of the committee, and will be glad to furnish full information regarding the work of relief and reconstruction planned by the committee.

**Fireproofing the Wearing Apparel.**—Scarcely a day goes by in any large city, says a writer in the *Illustrated World* (April, 1916) that does not record in its list of accidents one case of injury from burning clothing. A woman bends over the gas range and a hanging sleeve catches fire; children play with matches and strike them in such manner that the heads fly, or perhaps the whole box explodes; there are a thousand and one different ways in which flames can cause disastrous fires by igniting cloth fabrics in garments or furnishings.

Because women wear flimsier apparel, and because they have, as a rule, much more work to do around fire than have men, a new protective liquid now on the market should meet with their unqualified approval. This liquid is colorless, odorless, and it will not hurt the hands or cause the dyes in delicate fabrics to run. Any cloth fabric, from a lace curtain to an Oriental rug, that is treated with the preparation will resist successfully all encroachments of flames. Women's house dresses, treated in this solution, cannot be *made* to burn by any known method. Furthermore the appearance of the fabric is said to remain the same after treatment with the liquid.

Here is a test that any skeptic can make; it is said to illustrate forcibly the value of the liquid. Take an old piece of cloth or a dress that is no longer of worth as a dress. Apply the liquid and allow it to dry, then attack the cloth with the intense heat (1650 degrees Fahrenheit) of a plumber's blowtorch. The fabric will scorch and crumble wherever the direct flames play upon it, *but it will not take fire.* This test can, of course, be as easily carried on with a match, a hot coal, or any burning object, and the result will be the same, although not as severe. Even lace curtains—supposed to be absolute tinder when it comes to the matter of inflammability—will stand such tests as those outlined.

The company that is backing the new product urges that all firms that handle inflammable products, all theatrical scenery manufacturers, mattress concerns, and cotton warehouses, as well as all private home-owners, test this liquid for themselves wherever their fire risk is greatest. The company feels confident that all such tests will serve to increase confidence in the efficacy of their preparation.



**Belgian Scholarship Committee.**—This committee, organized by Dr. Nevil Monroe Hopkins, of Washington, D. C., about a year ago, has for its object the furnishing of practical assistance to destitute scholars and artists in Belgium and aiding in the work of reconstruction, especially in the educational field, after the war is over. The committee is planning to make a collection of American books, which will be offered to Belgium as an American library, and an appeal

# American Medicine

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**Community Clinics.**—The social aspects of medicine are increasing in number and complexity. Communal health is recognized as a fundamental desideratum. The principal difficulties, however, precluding its attainment are the lack of organization of society for its own protection and the paucity of medical facilities for giving communities the most efficient types of medical service.

Throughout the United States, largely in connection with educational systems, there has been developing a form of organization known as community centers. These represent a conscious effort to co-ordinate the various activities of communities so that a single structure may serve as a clearing house for the general recreative and social activities of the community.

It is the aim primarily to establish these community centers on a financial basis that will insure their self-support. Within the confines of a single building are held such meetings and forums, dances and pageants, games and contests as may be desired. Democracy is expressed through a community lyceum, a community theatre, a community chorus, or orchestra. In a word, the community center is destined to become a central point for discussion of vital problems relating to labor and politics, art, music, science and literature, in so far as those utilizing the centers thus seek expression.

Considering the educational phases involved, it is at once apparent that the public school forms the most natural meeting place for citizens. Indeed, since the school system is paid for out of public moneys, its continuous public service is a logical development if the people are to realize its widest benefits.

In establishing various measures for communal cooperation it would appear natural to give thought to the actual physical health of the community. Thus far a few social experiments have been made along the line of establishing centers of activity whose primary efforts have been the maintenance of health of the constituent parts of the community, or the restoration of the subnormal population to a normal condition as far as has been possible.

The entire field of preventive medicine constantly manifests the importance of organic cooperation between medical agencies and social agencies. To develop this co-operative plan in definite districts provides a better opportunity for successful organization. The particular needs of different portions of a community vary not only in their medical phases but in social requirements. Similarly, the facilities available are extremely variable. Too frequently the sections of a city presenting the highest morbidity and mortality rates lack the immediately available facilities required for at-

tacking the health problem. Such defects could readily be remedied by the institution of community activities upon a district basis or, as has been suggested by Doctor William C. White, on a definite unit of population. Hospitals, dispensaries, district physicians, and visiting nurses may thus be distributed in such a way as to promote various forms of public health activities.

At the present time those interested in the scientific care of the sick are seeking new forms of expression for their activities. Without disparagement of the services of private practitioners, it is patent that as individuals they are less able to give detailed scientific examinations—involving extensive laboratory and other equipment and the acquisition of special technique—than is a well organized dispensary or hospital. The very development of the specialties marks the limitations of private practice. Free medical clinics have accordingly multiplied in all cities, with the development of incidental abuses that cannot be too severely deplored and condemned.

**The time has come** when it is worth while, therefore, to consider to what extent special community clinics should be established with provision for the most modern diagnostic and therapeutic technique at prices within reach of the poorer laboring classes. If such a community clinic, for example, could be established with paid physicians, and fees for services that are within the means of the poor of the immediate neighborhood, it must be evident not only that a better type of medical practice will ensue, but that many of the evils of the free dispensary will be eliminated. Instead moreover, of sending a large part of the population into the free public clinics for special diagnostic investigation, as is so frequently

done, physicians themselves may take advantage of the special facilities afforded and secure for their patients in moderate circumstances certain refinements of diagnosis for which the practicing physician has neither the time nor equipment and the usual cost of which by private experts is prohibitive. Obviously the pay clinic will thus tend to limit the development of free medical services, for its evident advantages will attract many who have been going to the free clinic, not because they could not pay something, but because they could not pay the required fees.

That the plan carries certain possible dangers, for the medical profession especially, cannot be denied. Mismanagement, cliquism, selfish ambitions, personal antagonisms and prejudices, and so forth, may prevent pay clinics from achieving the success they otherwise could. But rightly conducted, with medical men having adequate voice in their direction, and there are abundant reasons for believing that they will prove advantageous to all concerned. One thing is certain, however, and that is, no communal movement or project can go steadily forward and become a permanent success that exists at the constant expense of—or requires persistent sacrifice from—any member or group of members of that community. The benefits, sooner or later, must be partaken of by all—or failure will be the inevitable outcome. For this reason, especial care will be needed in organizing pay clinics to safeguard the legitimate interests of the medical practitioners of each community and avoid as far as possible everything tending to favoritism and discrimination.

**Concrete examples of the benefits to be obtained from self-supporting clinics** are not numerous as yet, but still they are to be

found, as for example, in the Boston City Dispensary and the Lakeside Hospital of Cleveland. These small experiments, though scarcely begun, unquestionably foretell a new movement in medicine. Particularly do they mark a healthful reaction to the traditional institution for free medical service supported by philanthropic individuals or by public taxation. While these few have been organized in connection with hospital and dispensary systems, the motivating force behind them is as fully social as medical.

**The germinal idea** thus expressed will necessarily be fostered by a variety of social agencies with a view to expanding and developing it to its logical conclusion. It is not unreasonable to believe that communities recognizing the value of community clinics will seek to establish them. In so far as community centers are being established, it is obvious that, being representative of a democratic idea, they will appeal to the public as natural foci for developing their cooperative expression of the health protective instinct.

Undoubtedly, there will be more or less opposition, as is natural when any new idea is presented. With traditional reserve many medical men will refuse to endorse the movement until they are convinced of its propriety and wisdom, some will condemn it outright, while probably only a comparatively small portion of the profession will actively support it—in the beginning. Numerous examples might be cited to show that the larger part of the profession is conservative and slow to accept marked innovations. Perhaps under present day conditions, however, it is only natural that the fear of injuring private practice should lead to hesitancy in accepting the plan.

But properly conducted, with medical men duly represented in its routine management, and it would seem that the pay clinic offers an admirable opportunity to solve a great social problem which concerns a very considerable proportion of the people, and this not only without injustice or injury to practicing physicians, but on the contrary, to the substantial gain and benefit of the entire profession. Manifestly, with the success of the pay clinic from every standpoint depending so largely on its management, it behooves the doctors of each community to take an active part in the movement from the outset, thus aiding to avoid every possible abuse and to raise the project to its highest efficiency as a social health force.

At any rate, it is for medical men to decide whether the pay clinic will be fostered under their auspices, or—otherwise. Sound judgment will hardly dictate an adverse attitude on the part of the profession, for it is indubitable that the pay clinic is bound to come—supported and guided by the profession, or in spite of it. It is for the profession to decide.

The National Conference of Community Centers and Related Problems held in New York City, April 19 to 22 aimed to suggest to "community center workers the need and the practicable methods for making the community center effective in various fields of curative and preventive medicine and of public hygiene and health education."

It is to be hoped that medical men will not let the opportunity to aid and direct a splendid public movement be neglected or delayed until too late for the profession to exert its proper influence and accomplish its greatest good.

**Curing Diphtheria Carriers.**—With organized efforts to eliminate diphtheria, importance necessarily is placed upon the determination of and cure of diphtheria carriers. Typical diphtheria bacilli have been found in the nose and throat of 1 to 5 per cent. of persons who have not had clinical diphtheria. Wilcox and Taylor have reported 4½ per cent of diphtheria carriers among scarlet fever patients under their care, though in only half of them were the bacteria proven to be virulent.

Various attempts have been made to eliminate bacteria from the mucous membranes of such carriers. Sera, antiseptics, vaccines, rapid growing organisms like lactic acid bacilli have been advised for this purpose but general experience has shown that these are no more successful in results than may be achieved by the application of various medicaments, such as iodin, phenol or iodized phenol.

Ruh, Miller and Perkins report (*J. A. M. A.*, March 25, 1916) their experience in treating diphtheria carriers by means of tonsillectomy and adenoidectomy. They conclude, as a result of their experience, that the period of quarantine can be greatly shortened. The condition was relieved in a little over 8 days on the average after the performance of the operation.

While this operative procedure is thus urged, a second report by B. Rappaport, on "The Use of Kaolin to Remove Bacilli from the Nose and Throat," (*J. A. M. A.*, March 25, 1916) also is entitled to careful attention and trial. According to Rappaport crude kaolin thoroughly dried and sieved may be applied directly to the nasal mucous membrane by means of a powder blower. His practice is to make the application at two hour intervals for 6 treatments for children. Before each application, the

nose is sprayed with a cleansing solution of sodium bicarbonate and sodium baborate, 2 per cent each. In older persons, application to the pharynx is best made by having the patient swallow at 6 two hour intervals four half-teaspoonfuls of kaolin.

**The action of kaolin** is purely mechanical and the bacteria are removed apparently when the kaolin itself is removed merely because of their adhesion to it. The kaolin is neither bactericidal in action nor protective against bacterial infection.

Under this treatment the average stay in the hospital of 100 patients treated with kaolin was 25.61 days while the time for a similar number not treated with kaolin was 33.45 days. This shortening of the days in the hospital represents a material gain for the patients and economically and medically is exceedingly valuable for the hospital.

From the experience thus far reported, the treatment of diphtheria carriers with bacteria in the nose is more quickly successful than of those whose throats have become bacterial hiding places.

A combination of these two methods suggests itself as particularly useful. Inasmuch as the kaolin treatment apparently is devoid of all danger and requires no operative procedure, it is worth a widespread trial. If the kaolin treatment fails to be successful within a reasonable time, as for example two weeks, the removal of the tonsils and adenoids is indicated. The kaolin treatment is advisable only for "purely diphtheria carriers" by which term is meant persons with diphtheria bacilli in the nose or throat who give no history of sore throat or other symptoms of diphtheria and in whom a Schick test is negative. Tonsillectomy and adenoidectomy are probably more or less hazardous when the Schick test is positive. If antitoxic immunity to the diphtheria bacilli

is present, there is less likelihood of danger from these operations even though virulent bacteria may be present in the throat.

By the use of these two methods, there should be a marked decrease in the number of diphtheria carriers now forming travelling foci of infection in all communities. The elimination of the carrier will mark a tremendous advance in the prophylactic management of diphtheria as an endemic or epidemic disease.

to withstand the hardships of martial life depends upon a good vigorous constitution. The careful process of elimination of unworthy recruits indicates that the fundamental preparedness must be in the physical physique and stamina of citizens. The soldier in the field requires excellent teeth with which to masticate his hard biscuits and not too tender fare. Even an insufficient number of sound opposed molars is sufficient ground for rejection.

In England in 1898 over three per cent of the recruits for the regular service were rejected merely on account of bad teeth. This figure is exceedingly low because it merely shows the proportion of candidates rejected because of this single defect. In our own army during 1914, 134 per 1,000 recruits were rejected merely because of defective teeth. During the Boer war 3,000 men were invalidated, some because of dental disturbances beyond the control of the army dentists, while almost 25 per cent of the rejected applications in the British army were rejected because of defective teeth. In one year almost 1,900 soldiers in the French army received hospital care because of diseases of the teeth. Disabilities of this type are of vital military significance and they represent a cause of invalidism wholly within the realm of preventive medicine.

With our present clamor for preparedness, it must be appreciated that the development of physically fit citizens is the primary basis of preparedness. At the very basis of physical health is adequate nourishment and thorough digestion. The teeth at the very portals of the alimentary tract are the most important factors in preparing food for the action of digestive fluids. Preparedness does not merely mean the giving of military training because military men themselves recognize that ability

The ideal which should be presented in a campaign for preparedness is not merely the ideal that it is beautiful and glorious to die for one's country but that it is even more noble, high-minded and equally beautiful to live for one's country. It is a civic duty to be physically fit and mentally prepared to cope with the ordinary battles for national existence, for the promotion of the industrial welfare of the community, for the decrease of disease, pauperism, and crime, and for the maintenance of American ideals.

With such a point of view, the entire subject of preparedness must necessarily include a vigorous campaign in behalf of dental hygiene. The fact that the lack of dental hygiene is contributory to the existence of manifold diseases such as tuberculosis, malnutrition, industrial poisonings, septic infections and adenitis, rheumatic conditions, etc., is indicative of the serious nature of this comparatively untouched field of hygienic service. Conservatively speaking, more than 75 per cent of the children in the United States suffer from defective teeth and there are over six hundred thousand children in the schools of New York State whose defective teeth serve as a menace to their physical development, indeed to their mental progress and competency.

Under these conditions, it is timely that the people should be aroused to a recognition of the importance of the field of dental hygiene. Preparedness is a timely topic. It is impossible for communities to cast aside their responsibilities or escape their obligations. The strength and power and vitality of a nation is best advanced through a similar development of its citizens. The natural place to begin to prepare is with the children. Dentistry as a science is 2,400 years old and its civic value is merely at its dawn.

In 1766 Woofendale, the first dentist, arrived in America. It is fitting that as a commemorative activity dental hygiene should receive adequate attention. A Forsythe Dental Clinic or an Eastman prophylactic institution can result only when there is a full recognition of the relation of dental hygiene to public health. Then dentists, physicians, school and health officials will join hands with the social and philanthropic workers to attack an important problem which can only be solved by wide and prolonged cooperation.

**Gonorrhea and Fraudulent Marriage.—** A large proportion of the literature of agitation in behalf of health certification before marriage is due to a desire to protect future generations. Temporarily disregarding the eugenic aspects related to the days to come the every-day importance of premarital health certificates may be well illustrated by a recent decision of the Supreme Court of Wisconsin. *Social Hygiene* (April, 1916) quotes an opinion of Mr. Justice Winie granting an annulment of marriage. The husband was unaware of his wife's infection until after marriage. The wife knew her disease to be uncured. The husband was in total ignorance until subsequently he developed a specific urethritis. Thereafter no further sexual relations ensued and he promptly declared that the marital relation would not be renewed. The wife sued for divorce and the husband filed a counter-claim asking that the marriage be annulled. The court held that the marriage should be annulled by reason of the fraud which had been perpetrated by the wife. The presence of a venereal disease aggravated the character of the fraud. To quote from the decision; "Considerations of morality and health alike dictate that neither spouse should be compelled to submit to the indignity and menace presented by such an infection. The fact that, through the fraud and concealment of the guilty party, the other has, without his knowledge and consent, already been infected aggravates rather than palliates the fraud, and can not of itself be considered a confirmation of the marriage. Similarly, the New Jersey Court of Chancery, in refusing to annul a marriage on the grounds that a husband concealed the fact that several members of his family had been insane, decided (*Public Health Reports*, March, 1916) that "in the absence of a

statute courts could not annul marriages for fraud in concealing disease except when the disease was of such a nature as to render contact seriously dangerous to the other party of the marriage."

The fundamental legal point raised by the judge is in accordance with the dictates of abstract and practical justice. There is no defense for the unsuspected inoculation of a mate through the marital relation when it is possible to safeguard both candidates for matrimony in a legitimate way. In this specific instance, the wife chanced to be the offending party. More often the facts are reversed, for most gonorrhreal conditions developing during married life are due to latent and uncured infections of the male. The overwhelming majority of pelvic suppurations are thus innocently and unnecessarily acquired. Wifehood and motherhood are outraged and weakened. Love and honor fall prey to the gonococci. The husband-borne diplococci merit and demand more serious attention than has been given them in the past.

**Handling Venereal Diseases.**—Probably the greatest blot upon the efficiency of scientific medicine is to be found in our handling of venereal diseases. The lack of dispensaries and hospital facilities is glaring. No less astounding is the frequent discharge of patients with gonorrhea without the application of scientific methods to determine its continuance in a latent state. The microscope is not generally employed for the purpose of determining the presence or absence of Neisser's bacillus. The statistics of gonorrhreal disease constitute a sad commentary upon the too inefficient, unscientific, and irresponsible treatment of venereal patients.

Did wives possess the same knowledge

about venereal data now generally existent among males, suits for annulment of marriage might be commonplace to excite only passing interest. One weakness of our present system of permitting marriage would soon be manifest. A guarantee of physical health, or at least freedom from contagious or infectious disease, should be a prerequisite to marriage. It is scarcely believable that individuals knowing themselves to be "un-holy and unclean" assume the responsibilities of matrimony in spite of the possible dire consequences. Gonorrhea is within the realm of curable diseases and its continuation as a marital menace is not to be condoned. Its existence is a challenge to the forces making for public health.

There is no adequate reason why applicants for marriage licenses should not present at the time of their applications affidavits attesting their freedom from contagious or communicable diseases. Such sworn statements should be made by physicians after a careful physical examination supplemented by the necessary corroborative tests. The Health Commissioner or his agent should be duly authorized to pass upon and issue marriage licenses.

**Enlightened members of society** are today voluntarily undergoing thorough physical examinations in the interests of themselves and with a view to protecting children yet unborn. It will require a long period of education, however, to establish a public opinion that will call for the enactment of similar health regulations for the benefit of the careless, indifferent, slow-minded, or degenerate marriageables. The widespread devastations of gonorrhea during marital life indicate that radical attention is required for its extermination or palliation. The suggestion is far from radical but it is fraught with little danger except from the

conscienceless oath of a perjuring M. D.

During the past year, the Supreme Court of the State of New York handed down a decision annulling a marriage where one of the high contracting parties concealed from the other the fact of a tuberculous infection existing at the time of the marriage. Here again the legal decision was based upon the law of fraud. A prenuptial guarantee against the existence of contagious or communicable disease should prevent the perpetration of conscious fraud. To the physician the legal aspect is of minor importance. From the standpoint of public health, it is more important that every step be taken to insure the health of both parties to a nuptial contract in so far as it may be possible. It should be unnecessary to have recourse to legal provisions which technically are not interpreted in the interests of health and public welfare. The fraud to the Court is merely legal; to the intelligent physician it is a violation of public decency and a conscious or accidental invasion of the health rights of individuals—present and future.

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**The Boston Dispensary's Lesson.**—To those whose duty it is to glance through the almost countless reports of philanthropic institutions, it is always a joy and comfort to find one that breathes the breath of life and possesses animation beyond that of others of its class.

The Boston Dispensary has been in existence 120 years and the experience of age is manifest in its report of the work of its 119th year of service. No dry as dust statistics are presented, and no wearisome details, in large measure useless, are revealed in its pages. It tells not merely the accomplishments of the past but the promise

of the future. Not content with describing the work accomplished, it deals with the program for future developments. It possesses the richest material for the inspiration of dispensary workers that has been written in years. From the first words: "The Cure of Disease is a Public Necessity The Prevention of Disease is a Public Economy" it proceeds for fifty pages to indicate how the cure of disease and its prevention may be aided by rational dispensary organization.

Under the type of organization which it describes, dispensaries are not concerned merely with medical problems but investigate family problems due to insufficient income and unfavorable environment. Constructively, it provides for the after care problems for children and adults after their discharge from hospitals or dispensaries and by a systematic attempt to attack the serious problems by educational methods. A brief reference to some of the subjects discussed suffices to indicate the scope of activities recognized by this institution: the requirements for efficient diagnosis and efficient treatment, evening clinics for working people, health service for immigrants, self-supporting evening clinics, getting patients into hospitals, nursing service in a dispensary, a children's preventive clinic, what does social service contribute to medical efficiency, method of a medical follow-up system, functions of dispensary admitting, and the place of medical care in the workingman's budget.

During the year 1796, 80 patients were cared for and during 1915, 122,776 visits were paid by patients to the clinics. The years of service and the work accomplished reflect credit upon the institution and all connected with it. It has been a large factor in contributing to our modern ideas of

dispensary work. It is one of the few dispensaries which appreciate the firm tie between curative medicine and preventive medicine in reducing the sickness and suffering that has been responsible for the growth of our present dispensary problem.

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**Reporting Typhoid Fever.**—Milk, water, oysters, lettuce and various other foods have long been recognized as common factors in the production of epidemics of typhoid fever. Contact infection, either direct or indirect, is, however, the commonest method in the distribution of typhoid fever. The isolation of typhoid patients and the adoption of sanitary precautions for the disposal of excreta are now generally recognized as the most essential phases of controlling typhoid epidemics.

In order to establish preventive and protective measures, it is of fundamental importance that an early definite diagnosis be determined. The protean manifestations of typhoid fever frequently preclude accurate diagnosis until the disease has really become active in its processes and numerous persons have been exposed to possible infection.

Vaughn and Walker, discussing Typhoid Fever in Detroit (*The Journal of Laboratory and Clinical Medicine*, Vol. I. No. 6, March, 1916) quote the health office of Detroit as stating "During 1915, 50 per cent of deaths reported as typhoid fever had not previously been reported as cases. Failure of these reports cripples the Board of Health both in taking necessary measures for sanitary control and in providing accurate information for formulating a city policy relative to water supply and sewage disposal." In their conclusions, they draw

attention to the fact "that doctors have been somewhat at fault in their diagnosis."

The prompt reporting of a contagious disease is exceedingly important. This depends upon early diagnosis. The elimination of contact infection is bound up in these two items, whether their sanitary regulations are enforced by the community or by the attending physician.

Epidemiology, in connection with typhoid fever, demands the immediate report of cases of typhoid fever, for example, in order that study may be made of its probable etiology. Every case of typhoid fever thus occurring should be made the basis of investigation. The health of a city can be safeguarded only when the medical profession cooperates wisely and well. The presence of typhoid fever in a community is today an evidence of ignorance, indifference or neglect. Physicians should be the last ones to be contributory factors in the spread of any disease. Their failure to make a prompt report virtually places them in a category with those indifferent or negligent of the health interest of their community. Diagnostic shortcomings may be condoned, particularly when characteristic symptoms are not evident until the disease is advanced.

Failure to make use of available laboratory facilities may be due to ignorance, indifference or neglect, and is an unpardonable sin, particularly when such laboratory facilities are supplied gratuitously by the city or state. Failure to report contagious disease is violating the spirit of preventive medicine as well as the mandates of law. If typhoid fever is a crime, the doctor who fails to report the disease is *particeps criminis*.

**A fundamental principle of economics** which is as applicable to the economics of the body as to those of the people, was recently enunciated by Professor Henry C. Emery, of Yale University, in a very thorough and painstaking consideration of the question "After the war—what?" (*Collier's Weekly*, March 11, 1916). After making some comparisons between the economical conditions after the Civil War and at present, he makes the potent remark that "in normal times the productive power of a people is never exerted to anything like its full capacity, while their powers of consumption are expanded far beyond actual needs."

That this is a truism none will deny, and that the principle involved has a bearing upon certain matters which concern the medical profession is just as true.

If the productive powers of the body were exercised more nearly to their full capacity, if the muscles were used as they were intended to be used, or the mental powers exercised as they might be, many conditions which are the underlying basis of all chronic disease would never be permitted to exist. At the same time these sedentary and physiologically lazy individuals have expanded their powers of consumption far beyond the actual needs of the body; for it is well known that most of us eat far more than is good for us, because we eat more than the body actually needs.

Now Professor Emery rightly directs attention to the "tremendous economic reserve which can be called upon in time of crisis," and shows that the great margin between maximum production and minimum consumption is an extremely important factor to be taken into consideration in the study of the economics of war. Even so this principle applies in physiology, and therefore

in medicine. This vital physiological reserve is the only hope of the physician who essays to treat chronic disease, and from a purely therapeutic standpoint, as well, of course, as from a prophylactic standpoint, the main object of our endeavors should include a concerted attempt to increase the cellular production—of energy and wastes—at the same time economizing in the consumption of food, just as it has become necessary in certain of the war-stricken countries.

Reference has been made to this important principle, because it is so often overlooked or, at least, not given the consideration its importance deserves by physicians attempting to remove some complex syndrome of long standing. Too often our treatment consists in the application of many of the more or less unnatural stimuli which have come into vogue as a result of the advances in pharmacology and chemotherapy. Herein lies the reason for the failure of many a physician as well as the success of many a sanatorium—the productive power of the cells is not exercised as it might be, and consumption is not put under proper control. The same principle is involved in the so-called "Allen treatment" of diabetes about which so much is being said and written these days.

Systematic exercise and a physiologically useful occupation are often worth as much as all the remedies at our disposal, and when these are coupled with a properly regulated dietetic regimen, the results of our accustomed measures are so much better that they cannot be compared with the results following the same remedies given in the old-fashioned haphazard manner, with little or no attempt to change the fundamental underlying causative factors so constant in all chronic disease.

**Defeat of the proposed amendments to the Anti-narcotic Law of New York State**—commonly referred to as the Boylan Law—just as the Legislature was closing was hailed with genuine satisfaction by the medical profession. The reason for this, however, was not opposition to the principles or purposes of these amendments. As we have said on repeated occasions, there is not a reputable physician in the state who will not approve of effective, commonsense regulation of the sale of the habit forming drugs. But the drug legislation thus far brought forward has been drawn with such evident disregard of the practical problems of drug addiction—through ignorance or otherwise—and the whole proposition up to now has partaken so strongly of the flavor of a police measure directed against drug addicts—and the medical profession—that it is not surprising the antagonism of physicians and the intelligent laity has at last made itself felt. If the whole story of the recent agitation against habit forming drugs could be written, and the underlying history of existing and proposed laws related thereto completely disclosed, it would make interesting reading, to say the least. Perhaps some day the tale may be unfolded, and the public given a chance to learn just how disinterested and humanitarian were some of the motives back of the movement.

The medical profession is heartily in favor of laws restricting and regulating the sale and use of narcotic drugs, but it insists that these laws, to accomplish the greatest good and cause no needless hardship or inconvenience, shall be drawn by those who have a broad and comprehensive knowledge of drug addiction and its associated problems. Place all reasonable restrictions on the administration of these drugs by medical men. Require physicians to keep complete and accurate records of the purchase and

use of all narcotic drugs. All these are right and proper; no medical man can take exception to them. But to place any restrictions on a physician's judgment—to set any limit in regard to how, when or in what quantity he shall administer narcotic drugs, or to lay down definite or routine rules for the management of his patients, even though addicted to drugs—is an abridgement of professional rights, privileges and prerogatives that cannot be tolerated for an instant. The very nature of a physician's duties and obligations to his patients makes it imperative that he shall be free to act at all times and under all conditions, according to his own judgment and conscience. The practice of medicine entails enormous responsibility on practitioners of medicine. The state has a right to make sure that the physician is capable of assuming the responsibility of his calling. This it does through its medical practice acts. By giving the physician a license to practice medicine and declaring him fitted to assume the responsibilities of his profession, the state to a certain extent fixes those responsibilities. At any rate, if the physician engages in the practice of medicine under the right conferred by the state, he is forced to assume the responsibilities the state says he is capable of assuming. This being the case, and with the state insisting that the practitioner of medicine shall carry his full responsibility, can the physician brook any interference with his methods or practice—founded on his best judgment and conscience—in any case or class of cases? Has the state the right to lay down certain definite regulations as to treatment, and while forcing the practitioner of medicine to carry full responsibility in each case, demand, irrespective of his judgment and conscience, that he follow such treatment? We do not think so, and earnestly believe that the duly licensed

physician is the last authority as to what he shall use—as well as how and when—in every case that he is called upon to treat. This must be so, or the whole structure of medical responsibility falls to the ground.

Nevertheless, it is apparent that there is a well defined movement on foot, actuated by various motives, to impose many limitations on the practice of medicine. If medical men do not protest and show to the public the unfairness and dangerous tendencies of such legislation, a large number of laws are sure to appear on the statute books in the near future that will not only impair the usefulness of the practitioner of medicine, and cause much inconvenience without the slightest advantage, but also impose hardships and dangers on the sick and suffering that will be neither warranted nor necessary. Unfortunately, medical men do not concern themselves sufficiently with legislative matters even when their own rights and interests are involved. Pernicious as were the proposed amendments to the Boylan law, only a very few physicians actively opposed them. What these valiant few accomplished, however, tells eloquently of what can be done by the medical profession when right, justice and common sense are on our side. The gratitude of the local profession is due in unlimited degree to Drs. Rooney, Bishop, Davin and several other physicians who appeared against the amendments at the legislative hearing and pointed out the objectionable features of the proposed legislation.

It was a wise and commendable move of the law makers to create a commission to investigate the drug question. The appointments to this commission have not been announced as yet, but it is hoped it may be made up of men who have a deep interest in the subject "without any axes to grind." Such men will be able to consider all phases of the drug question and make a report that will lay the foundation for legislation that may be expected to solve the drug problem, sanely and humanely.

incarcerated British physicians, comes as a shock to medical men everywhere. Without stronger evidence than has been presented thus far, however, we refuse to believe any such hideous charge against members of the medical profession. Saddened and sickened by the holocaust of war and the spectacle of a large part of mankind devoting every thought to wreaking the utmost of suffering and distress on their erstwhile neighbors, one bright particular star has shone constantly from the darkness of hatred, enmity and passion. This star has been the loyalty of medical men to their principles of humane service. In the presence of suffering and agony the doctor's sympathy, kindness and instant service have been never failing. On the battlefields enmity and the lust of combat have made men oblivious to every desire but to kill, to hurt, to destroy. Every instinct of kindness, of decency and brotherly love has been stifled. With joy, many a man has watched a bullet carry instant death to some smiling boy, snuffing his life out as one would a candle; with a shout of satisfaction many a man has driven his bayonet into the neck of another and laughed with glee as the blood poured forth and a hoarse gurgle told of a soul ushered into eternity. This is war. But while men with the demoniac poison of war coursing through their veins have had but one aim, one thought, one great moving impulse—to kill or injure their opponents as grievously as possible—to produce the maximum hurt within their power—back of each line the doctors have been working with equal fixity of purpose to reduce war's fearful toll. With the swift changing of the battle lines, the doctors of each army are called upon to minister to the wounded and dying of both sides. But there is no question of friend or foe to the physician. In the young man breathing his last in the enemy's uniform, the doctor sees no enemy; just a stricken human being gasping for breath and rapidly drifting out into the "great unknown." With gentle touch the cramped limbs are straightened, the clothing loosened, and with deftness and dispatch everything done that can be to make the last few moments as comfortable as possible. Gratitude shines for an instant in eyes growing glassy, but soon all is over. Is there one who will deprecate the service that gives comfort to the dying soldier and en-

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**The Report from the Wittenberg Prison Camp** to the effect that during an epidemic of typhus fever the medical staff in charge of the camp deserted their posts, leaving the afflicted in the care of a few

**"WHAT MAKE YOU FROM WITTENBERG, HORATIO?"**

riches his final moments with grateful thoughts?

So it is, the doctor with his pitying kindness, his sympathy and the service he renders, bridges the gap between barbarism and civilization. Out of the ruck of animosity, hatred and unbridled malice, the medical men of each nation can emerge with no apologies or explanations to make to civilization. They have been able to adhere to the highest, noblest principles of mankind and still continue to fulfil their entire obligation to their country—and humanity.

It is because of the just pride medical men have taken in their calling that the Wittenberg report is so disconcerting. In a sense it is an arraignment of the entire medical profession. All that we know of the physicians of every land makes it incredible that any such event as has been claimed could occur. We sincerely hope that our German confreres will take steps at once to refute the charge and prove it a base calumny. "What make you from Wittenberg Horatio?" may well be the question of the hour for medical men. We who prize among our fondest memories and dearest friends those made in happy student days in dear old Germany, can have no doubts of what the answer will be.

**The reaching of dogmatic conclusions** is a habit that the medical profession should shake off and for ever keep away from. There has been a marked tendency on the part of some physicians, and others, to set down hard-and-fast conclusions in a manner which is calculated to mislead those who are willing to put their trust in the experiences of others without further ado. Particularly is this true in some of the articles on therapeutics and the value of this remedy and that, as published in our esteemed contemporary, the *Journal of the American Medical Association*.

It is not our intention to single out various statements of this character and endeavor to show that the conclusions are often both dogmatic and erroneous, but some recent correspondence in the columns of the *Journal* with advantage may be referred to here.

Some months ago Blankenhorn attempted to set down the truth regarding the com-

parative merits of strontium and sodium salicylates (*Jour. A. M. A.*, Jan. 29, 1916, p. 331). He concluded that statements that the strontium salt is a satisfactory substitute for the better known sodium salt, because of the facts that it is less disagreeable to the taste and less irritating to the stomach, are untrue, and that Hare and others have made this remark with no well-established starting point and it has been "lugged along" from one edition of their books to another.

Naturally Hare does not remain silent and in the *Journal* for March 4th, 1916, "comes back" in the style for which this famous Philadelphia internist and editor is justly famous.

We do not propose to "lift" more than a very small quotation from Hare's communication. Besides showing the fallacy of Blankenhorn's position by quoting his own statements, Hare says and says well: "The question as to whether strontium salicylate is better tolerated by the stomach than sodium salicylate hardly justifies the length of this communication, which is intended as a protest against the reaching of dogmatic conclusions based on evidence which is largely fictitious, the result being that the casual reader is misinformed, and discards a drug which, possibly, may render him good service in time of need."

**Medical Progress.**—The College of Physicians and Surgeons of the Medical Department of Columbia University has taken a noteworthy step in advance. Its doors are to be opened to women. This is a development warranting the congratulation of women, but more particularly Columbia University. In round numbers, there are approximately one hundred medical schools now open to women. It is now generally admitted that women are to have free entrance to the medical profession. Under such circumstances, every opportunity for securing the finest type of medical education should be available. Fully 80 per cent. of the women who have studied medicine have attended co-educational institutions.

With the vast endowments necessary for establishing first grade medical institutions, it is rational to expect that the large institutions now open to men but barred to women

should gradually open their doors for the purpose of training feminine colleagues. There is little legitimate reason for segregating the sexes for the study of medicine. Greater accomplishments will result by admitting women to the benefits of institution. Johns Hopkins with its high educational standards, Cornell, the University of Toronto, and similar institutions have acknowledged the place of women as desirable students of medicine in their respective institutions. The larger the number of medical colleges admitting women, the greater will be the advantages afforded in the way of medical internships and general hospital training.

The present war has elevated the position of women physicians. They are being called upon to meet the great demands of civil practice and are being rallied to national defense in all the belligerent countries. Their capabilities, conscientiousness, experience and assiduity in performing their medical duties have unfolded their possibilities in a most striking way.

The opening of the doors of the College of Physicians and Surgeons to women is no less important than the fact that the educational standards for this institution are at the same time to be raised, so as to require a preliminary education of medical students equivalent to that received by the graduates of Columbia University taking the combined course in arts and medicine previous to their actual entrance upon their medical studies. Columbia has made much progress by these two acts.

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**Therapeutic Vitamines.**—The importance of vitamines in the treatment of diseases like pellagra, beriberi, scurvy, and possibly rachitis, naturally has aroused much interest and inquiry as to the nature of vitamines. While they are widely distributed in food products in varying proportions, if diets are comparatively free from foodstuffs rich in vitamine content, abnormal metabolism results.

Seidell (*Public Health Reports*, February 18, 1916) has succeeded in developing a stable form of vitamine from brewer's yeast. Clinical experiment on pigeons indicates that autolyzed yeast filtrate contains sufficient vitamine to prevent the occurrence

of polyneuritis and possesses marked therapeutic powers after paralysis has occurred following an exclusive diet of polished rice. While the securing of this vitamine may not solve the immediate problems of preventing pellagra and similar metabolic disorders, it most assuredly suggests the possibility of concentrating the special type of vitamine requisite for the prevention and cure of such diseases. Experiments of this character are calculated to encourage further research so that a large group of metabolic diseases will soon become as preventable as beriberi or scurvy. The cure itself is bound up in isolating the determinative vitamine.

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**Dental Hygienists.**—In the campaign for remedial action against dental defects the greatest difficulty has been encountered in securing an adequate number of dentists to perform the work required. It is impossible to fill all the cavities in the teeth of school children without any reference to orthodontia or special oral surgery. There is at the present time an inadequate number of dental dispensaries or clinics to cope with the situation. In New York City the number of children found with defective teeth as the only physical defect is varied from 30.2 per cent in 1909 to 42.1 in 1914. Of 500 children examined, to illustrate the prevalence of defective teeth, 486 were discovered with teeth requiring attention of one sort or another. The entire 500 required cleaning of the teeth. The total number of children receiving dental treatment other than extraction consisted of only 25.

As a prophylactic measure the maintenance of clean teeth and the establishment of good oral hygiene is essential. To accomplish this end, however, the long professional training of a dentist is not always required but the services may be performed by specially trained individuals, preferably those possessing in addition some nursing training. The development of dental hygiene nurses portends a new field of occupation for women and should serve to relieve dental dispensaries, clinics, and private dentists of most of the actual physical labor required to clean teeth. The prophylactic phases of dentistry may be taught to persons properly qualified in established courses of study in connection with dental colleges, infirmaries, dispens-

saries or hospitals. Preferably such a curriculum should be under the control of state departments of education.

It must be understood that steps have already been taken to instruct children with defective teeth in the methods of oral hygiene. Such educational methods have been in the hands of school nurses who have stressed the importance of the daily use of the tooth brush and the importance of mouth hygiene. Under their direction, the instruction is carried into the home and mothers are urged to care for the baby's teeth with a view to establishing proper dental habits. Similarly, educational departments throughout the country are spreading information with reference to the function of teeth, the necessity of their preservation and the methods tending to raise the standards of mouth cleanliness through the direct teaching of children in connection with instruction in hygiene and physical training. This work, however, is still in its infancy.

The dental hygienists should be subject to some form of licensure, regulation and supervision by the state. Their field of activity thus could be sharply defined and the likelihood of violation of protective regulations would be less pronounced. Such hygienists would be of immense service in cleansing teeth, in removing lime and accretions from the teeth and maintaining the mouth in a more healthful condition. Such service would serve to protect not only permanent teeth but the temporary teeth. This function is not to be demanded on the mere basis of dental esthetics. It is a type of service which should react very favorably upon the physical health and welfare of the children having the opportunities of receiving the benefit of such oral hygiene.

The training of experts in oral hygiene will not be a difficult task. The nature of service that they may perform for the community is of inestimable value. From the standpoint of prophylactic education, this professional service is most commendable.

Under the auspices of the New York Department of Health an amendment to the existing New York State Law covering the practice of dentistry has been introduced in order to secure the ends indicated. While this may seem to some to be a tendency towards fine specialization of a particular phase of dental work, it cannot be gainsaid

that under our present unsystematic approach to the problems of dental hygiene, dental inspection and dental repair have been achieved to a negligible extent. Freeing the more expert service and utilizing specially trained hygienists will be an economy in time, and increased efficiency of directed effort and a more satisfactory approach to what is at its best a monumental dental problem.

**Convulsive Tic.**—One of the most distressing of physical infirmities is that which consists of spasm of parts of the face supplied by the seventh nerve. It serves at once to make the sufferers conspicuous and not infrequently the object of rude observation; especially is this true when the individual happens to be a young girl or woman. The multitude of remedies recommended for the various forms of tic is so voluminous that one is at once impressed with the probable inadequacy of them all. Calcium chloride has recently been recommended by Emmerich and Loew, (*Münchener Medizinische Wochenschrift*, November 24, 1914). Loew declares that the affection is due to calcium deficiency in the cell nuclei, an assertion he undertakes to prove by citing in illustration the case of a man forty-nine years old, who had been afflicted for twenty years. The tics had increased to 45 per minute. They were violent, reducing him to a physical wreck. There was hypertrophy on the affected side of the neck with some atrophy on the other side. The history of the case showed that the patient had always been a great meat eater. Vegetables and fruits were seldom eaten while milk was never taken. The intake therefore of lime or magnesium was small. Patient was placed on a vegetable diet, rich in lime and a 20 per cent. solution of calcium chloride. The tic frequency gradually decreased to 7 per minute, finally ceasing altogether, while muscular strength and energy returned. The authors declare that to secure permanent favorable results the calcium must be given for months. They also advise this treatment in myoclonus.

It would seem that while too few cases are reported to be convincing, yet the treatment is so easy of application that it should receive a careful trial.



## INCIDENTS IN THE LIFE OF A PHYSICIAN.

BY

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In 1852, when a medical student, McGill College, I fortunately made the acquaintance of Mr. Hughes, retired Chief Factor of the Hudson Bay Company, a remarkable personality, short stature, marked activity of intellect and body, and in Indian lore quite an authority, from long practical experience with Indian tribes in the far West. One day he remarked, "I do not wish to shake your confidence in medicine while I relate some of my experience in discharging my duties as a Chief Factor over the Indians. When packing my trunk, in Montreal, after appointment, there was a vacant space, and how to fill it was the problem. So, I fitted in three volumes of Burns' 'Justice,' that I might prove something of a law-giver in that vast new country. On my arrival in the Saskatchewan district, I made the acquaintance of many Indians who were most friendly and attractive. From some unknown reason they one and all decided I was what was termed 'a medicine man,' and nothing could convince them to the contrary. From that time forth I was sought after to remove all the ills that flesh is heir to. My knowledge of disease, or medicine, was very limited. I concluded to prescribe

Burns' 'Justice,' tore out a sheet from a volume, rolled it into a bolus, giving strict injunctions to the invalid to place it under his pillow, sleep on it for a couple of weeks, and then report progress. During my term in the West of some years, I prescribed thus the entire three volumes, and feel confident the Indians never made better recoveries, or received more 'justice,' than in my term of official duty."

### MY FIRST CASE IN PRACTICE.

"In my boyhood, of fifteen years, I began noting the results of my father's wide practice in Glengarry, as a physician. He frequently rode miles in that district, and occasionally absent days at a time. On one occasion an old patient of his called, stating his wife was very ill, and wished to know if, in my father's absence, I could do anything for her. I invited him to take a seat, and that I would give him a few powders, until my father returned. I at once secured a tablespoonful of flour which the cook browned in good form and I made into twelve powders to be taken night and morning in sugar and water. In about a week the farmer returned to secure an additional supply of the medicine, stating his wife never got anything that did her so much good. 'What did you give her,' asked my father. 'Simple browned flour.' 'What a remedy,' said he, 'and how remarkable the result.' This was my first experience in the

art of prescribing, and in my lifetime, I never experienced more marked success. The influence of Mind over Matter is truly remarkable and the most successful physicians are those who have the power of imparting confidence which, as a factor of relief, actually knows no bounds.

In 1874, suddenly called to Basketong Station, Gilmour & Company, Gatineau, fifty miles distant, mid snow, frost and heavy roads. On arrival found the case was not fracture of the thigh, as informed, but paralysis, right side of body, complete, with retention of urine very acute. The case was imperfectly reported, and I had every appliance but no catheter. What to do under the circumstances and such a distance from Ottawa was the problem. Quietly resting in my chair to decide on course of action, an idea struck me of many years past, reading the life of Dr. Clutterbuck of New York, as a student, I adopted a suggestion of a practical character to cut a hole in the lining of an old warm winter coat and insert an elastic catheter held safely in the coat's tail. I at once examined closely my tried friend and there to my delight discovered the catheter, which at once afforded relief and saved the life of my patient pro tem. Any port in a storm, and it is a safe expedient under such circumstances to have a catheter near at hand.

My first case of stone in the bladder. In 1860 took charge of a ward in the General Protestant Hospital, Ottawa, where my attention was called to a patient laboring under a severe attack of whooping cough. A young lad aged sixteen, thin, pale, and distressed, owing to inability to retain his urine, when coughing. On examination, the urine was discovered to be quite ammoniacal voided in considerable quantity and this irregularity noted particularly since cough

developed. I at once concluded a foreign body was the source of difficulty, sounded the bladder, and defined the presence of stone, removed successfully in a few days by the lateral operation. The chief source of difficulty was non-union of the incision owing to spasmodic action of cough on the wound, which, after several weeks, closed completely, and patient discharged entirely free from both cough and stone.

The late Sir Andrew Clark, London, remarked to me, every case should be examined thoroughly, that there may be no link wanting in arriving at a correct diagnosis.

In 1874, I was summoned to Sir John A. Macdonald, in the Commons, where he was suddenly seized with acute pain in the region of the left kidney, which proved to be owing to the passage of a renal calculus. The pain was so intense, he was removed to a room in the left block of Parliament buildings, a hypodermic administered and perfect rest enjoined. After some hours the difficulty was removed and a normal state of system restored. The following day Sir John asked me what this kidney stone really was, when I stated—'A small gritty calculus.' At once Sir John replied, 'Confound those Grits, I knew they would be the death of me some day.'

In 1873 I was called to Strathcona Hall, and on arrival, found Sir John had a slight cold. I was invited into his studio, where he sat in a large armchair, warming his feet to the fire, and reading a book in which I noted a yellow marker. This, Sir John drew out, and asked me to read. A cable received the night previous from Grenfell, London, England, stating that arrangements had been completed for construction of the Canadian Pacific Railway. 'Well,' said Sir John, 'after such a cable, I thought the best thing I could do this Sunday morn-

ing, was to read my Bible, and thank God for what He had done for Canada.'

In July, 1860, I was summoned to an accident in Cumberland, Ont., by a messenger on horseback. A farmer crossing his fence carrying a large scythe on his shoulder accidentally punctured an artery and blood flowing freely. At 2 a. m., raining cats and dogs, I mounted my horse and off we set a distance of 25 miles. On arrival found the thigh fortunately tightly tied by a pocket handkerchief and the wound in popliteal region tightly packed with softened tobacco. This I at once removed, washed the wound and found the popliteal artery had been seriously punctured by the scythe in crossing the fence. I at once secured the best light possible—a strip of woollen cloth saturated in sweet oil in a small cup, in fact the old Roman lamp. To save life and without delay I found it necessary to ligate the femoral artery and slackened the compress when bleeding from the wound was still active. Compress at once replaced. I examined the femoral artery carefully and ligated higher up owing to an abnormal subdivision of the artery. Compress then removed and no return of bleeding from popliteal wound. The parts were carefully dressed and the case placed under the charge of a local surgeon. In a few weeks an excellent recovery followed. In those days, country roads were not inviting and household effects not encouraging, and yet it is surprising how life is saved 'roughing it in the bush.' "

#### SKIBO AND LUMBAGO.

In 1902 while attending meeting British Medical Association, London, invited to Cromarty, Scotland, where the 100th anniversary of Hugh Miller was celebrated and hundreds assembled from far and near to honor the memory of the greatest geologist

Scotland ever produced. At the conclusion of a brief address on the scientific institutions of Canada, a gentleman, on the opposite side of the table, extended his arm, and invited me most warmly to Skibo Castle, which I visited the following day. On arrival, Mrs. Carnegie, at lunch, stated she regretted her husband was very ill and could not be seen for a fortnight, as he had a sharp attack of lumbago, which she learned, was produced by stored electricity. I informed her that idea was from a paper I had written some years ago on this subject. I was invited to Mr. C.'s bedroom where he was prostrated and suffering pain in lumbar region. "Can you do anything for me?" said the worthy Laird. "Assuredly I will have you about in a half an hour." He was placed on the sofa back exposed and parts sponged with warm water and dried carefully. The lumbar muscles firm as a board and painful on pressure, but no rise in temperature, and the attack came suddenly, rendering him unable to move about. I at once punctured the stiff lumbar muscles with No. 8 small needles, eight or nine on either side of the spine an inch apart, pressed by my thumb nail half their length into the muscular tissue, with some difficulty owing to excessive muscular rigidity of the disturbed parts. In a few moments the pain in back suddenly departed, the punctured muscles becoming quite soft and pliable on pressure and the needles removed with no difficulty whatever. The sudden transition from an abnormal to a normal state of the back muscles was most remarkable. The patient then seated on the sofa stood up and walked stating all pain was gone and he felt perfectly free. His exclamation was, "Is this a miracle or a faith cure?" I replied, "it was the science now practiced in Canada."

In an hour he dressed, visited guests in his drawing room, much to their surprise and from that date to the present no return of the lumbago.

As to the abnormal accumulation of electricity at times in muscular tissue particularly in the lumbar region, there is no doubt whatever, as defined in my paper, *Montreal Medical Journal* many years ago, since which time this method of puncture has proved a blessing to many sufferers from lumbago and generally adopted by the profession.

#### SERUM THERAPY IN 1861.

In 1861 my general health was on the decline, from an unknown cause, which I concluded resulted from some poisonous influence contracted while on duty, General Protestant Hospital, Ottawa, never contracted syphilis or anything of that character. I made every effort to regain my usual health and strength without evident success. In 1861 was invited by the late Dr. Hamnett Hill to assist in a surgical operation in the General Protestant Hospital, and contracted blood poisoning—the outlook most unpromising. After several weeks' serious illness, made an excellent recovery, my system regaining in every particular the normal state of health and vigor. To account for such a marked constitutional change for the better, aroused in my mind the idea, one poison had actually counteracted another. It then struck me to test the effect of serum of ordinary vaccine lymph, in skin disease particularly psoriasis, and with most practical results. On the 20th of February, 1863, after three years' careful research, published a record in the *Medical Times Gazette*, London, England. From that date to the present I have enjoyed perfect health, and never absent from duty a single day. At that time owing to the re-

markable results of vaccine serum in disease, I felt we were on the eve of a great change in therapeutic serum power, and placed in my paper of 1863, a paragraph in large type that "Man has still much to learn." Since that date Virchow, Pasteur, Koch, Lister, Wright and Flexner have revolutionized the domain of bacteriology by remarkable scientific achievements. Since 1861 I have frequently used the serum of vaccine as an alterative in cases of constitutional debility with excellent results.

The late Dr. Radcliffe Crocker, University College, London, in 1896, noted favorably my paper in his able work on skin diseases.

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#### "WOUNDS OF THE HEAD DURING THE PRESENT WAR."

BY

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Wounds of the head are especially frequent in modern warfare as a result of the extensive employment of trench fighting. They may be divided, according to Page, into perforating, tangentile and furrowed. Of these the tangentile prove to be the most dangerous, the bullet plowing through the skull leaving in its wake an open furrow and numerous splinters. These splinters often penetrate the brain tissue and are difficult at times to locate, causing much trouble.

The skull is the mechanical protectorate of the brain and its annexa, and is divided by most anatomists into two parts: the cranium derived from the Greek *Xpavos*,

meaning helmet, and the face. The former consists of eight bones, namely, occipital, two temporal, two parietal, frontal, ethmoid and sphenoid, and is the division generally referred to when speaking of fractures of the cranium. The latter is composed of fourteen bones and is rarely categoricalized under the general heading of fractures of the skull, the name of the bone injured be-

the second fractures of the base, and in the third those complicating both base and vault.

The vault is the most frequent seat of injury being caused by trauma such as that produced by the butt end of a rifle or iron bar, both of which are useful weapons in hand to hand fighting, the bone giving away at the point of contact, causing a simple cracking or fissure. These frequently extend

FIG. 1. *Fractura Crani.*

ing usually referred to as fracture of the maxilla, of the nose, zygomatic process, etc. We will then consider here those bones which help to comprise the helmet or true cranium, and in order to systematically speak of these we may conveniently divide them into three classes or groups—placing in the first group fractures of the vault, in

to and involve the base of the skull and are accompanied by considerable hemorrhage. In such fractures the causative agent acts broadly upon the skull, causing the bones to over-exceed their limits of elasticity, consequently modifying their shape and bruising their contents. Should the fissure remain localized in the vault and not com-

plicate the base it will usually be found to affect only the outer table, and when involving both the outer and inner tables extensive splitting of the latter may occur. A red line on the bone, which persists after sponging, is diagnostic of cranial fracture in practically every case.

In cases of trauma, where the bullet or shell is consumed in breaking the bone at

tures, and I am sure they have become quite common in some of the large clinics of Europe. In twelve patients the skull had been pierced by a rather large bullet fired through the roof of the mouth, and after plowing through the cerebrum made its exit through the internal and external plates or tables of the frontal bone near the anterior fontanelle, fissuring the bone in several direc-

#### FIG. 2. *Defektus Crani.*

the point of impact, there is no general change in the shape of the skull. Under this localized impact the bone may give away, both its outer and inner tables being usually driven inward to cause a comminuted fracture. But a few cases have previously been reported where the bones were driven outward. I was fortunate enough to have under my personal care over 20 such frac-

tions. Many of the splinters and pieces remained adherent and protruded outward. (Fig. 2).

The outer table may be injured without involvement of the inner, or the inner table alone may be depressed or broken, even extensively splintered, without any involvement of its outer covering.

The most common form of fracture with

depression is that in which several fragments, more or less of a triangular shape, have their points extensively driven downward and finally wedged into each other, while their bases still remain on a level with the surrounding bone; cracks or fissures involving the outer table frequently radiate

the involvement to be of a more extensive nature and of a greater degree, probably due to its brittleness, or as Dr. Agnew has theorized, "the greater curvature which it presents." These fractures are almost always compound because of the character of the causative agent, the skin

FIG. 3. *Fractura Mandibulae.*

from the depressed pieces as shown in illustrations. Fracture alone of the outer plate occurs so rarely that thorough examination, no matter what the condition, will usually show that although the outer plate or external surface alone appears fragmented the inner plate will prove

yielding under it like the bone, thus placing it in the class known as compound comminuted, depressed fracture. In the treatment of such cases it is important to recognize the occurrence of fissures, the edges of the torn periosteum or cranial suture being easily mistaken for them. The im-

portance of recognition is due to the possibility of a more extensive lesion beneath and of infection.

When the bone is broken or depressed fragments must be raised and all the deep particles removed under antiseptic precautions. The wound should then be closed, after hemorrhage has been controlled, a small opening being left for drainage purposes. In these instances, if there is evidence that the bone has been depressed and clinical symptoms of irritation or functional derangement occur, immediate and energetic operative measures should be adhered to, and, if carried out at the right time, the results will prove excellent if part of the frontal lobe is removed, which I found it necessary to do in two instances because of sepsis and prolapse. This was followed by complete recovery with but slight impairment.

In direct penetrating wounds where the projectile is close to the surface, it can, and should be, easily removed; but when deep seated removal is unsatisfactory. It is not only unsatisfactory but an indication of bad surgery. Several well-known authors of extensive works on surgery advocate the practice of seeking for the bullet by probing along the "bullet track," as they call it, with long, delicate, needles, aluminum and telephone probes. Let me explain why this has been found to prove of detriment. In the first place, in practically every bullet wound of the brain I examined—one hundred and fifty-three—great solutions of the brain substance and thrombus formations completely obliterated or closed up the so-called "bullet track," and although it was possible to ascertain the direction the projectile had taken, it was utterly impossible to follow it. In the second place, probing or forcing needles heedlessly into the brain

substance with but flimsy prospects of obtaining the desired result should be contraindicated in all cases. I have stated before that nine-tenths of the wounds involving the brain are infected at and around the seat of entry, and should we open a passage way such a needle or probe would most certainly go further into the brain substance, infection would most certainly follow, resulting without doubt in early convulsions and death.

Irrigation is another practice in the treatment of these wounds that I must deplore and disavow. It is of no value, and will also most certainly cause infection. Dry sterile gauze pads, or a slightly saturated H<sub>2</sub>O<sub>2</sub> dressing are quite sufficient and will be found to meet all requirements with the best results.

Prof. Eiselsburg of Vienna finds it best after relieving symptoms of pressure and abstracting the offending fragments near the surface, to place the patient in perfect quiet and await developments. Some recover, a few develop abscess formations, and some fail to respond to treatment and are lost. Let me point out here the absolute irrationality of using iodoform gauze as an aseptic dressing. Reason for yourself: that if the iodoform, of which there is usually plenty on the gauze is sufficiently strong to kill microbes, it will and does certainly exert a very detrimental irritating effect upon the delicate brain tissue. I am fully convinced that many a case died because of just this useless, absurd idea of the necessity of iodoform in a wound.

Prolapse of the brain tissue indicates a more severe and diffused brain involvement, causing edema or swelling of the tissue affected. The prospect or outlook in these cases is so bad that operative intervention is

not advisable, the trouble being already too generalized.

Circumscribed fractures of the skull, although not commonly met with, should be mentioned. The head may present a complete circular solution in the continuity of its bones, which may be divided into two lateral lobes that are freely movable. The ethmoid may be driven in by a blow on the nose, and many other such rare conditions are frequently met with.

Fractures involving the base of the skull may also be fissured in nature, being continuations from vault fractures. The frequency of their occurrence may be usually shown in Aran's law, "fractures of the vault pass to the base by the shortest route." Indirect fractures or fractures by contre-coup occur with a reasonable amount of frequency. The most common of these result from shock transmitted along the spinal column. The condyles of the lower jaw may also be driven through the roof of their socket. Involvement of the anterior fossa may be caused by wounds through the nose or roof of the orbit, or radiate from fractures of the vault. Blood and spinal fluid may flow freely from the nose, the eyes may bulge and present a subconjunctival ecchymosis.

The middle fossa is the most frequently involved, the solution occurring through the petrous portion of the temporal bone opening up the middle ear and tympanic membrane. The seventh or facial nerve is of course affected, and by continuation the fractures may spread to the middle meningeal artery and to the anterior fossa. The posterior fossa when fractured results more fatally than either of the two just mentioned on account of its proximity to the medulla. The circular fracture or ring fracture occurring about the foramen magnum

is a good example. It may result from the impact of the skull through the occipital condyles upon the spinal column. Battle's sign is of great help and importance here, "discoloration of the mastoid region when obtained is indicative of fracture of the posterior fossa, and is usually complicated by brain injury."

There is not a specific treatment especially applied to fracture of the base. The area involved should, of course, be rendered antiseptic if possible, the upper part of the nasal fossa being, in the majority of cases, always sterile.

It is quite unnecessary to irrigate the nasal septum, as the septic chances far exceed the aseptic ones, and as good results, in fact better ones may be obtained by plugging it up with plain gauze or cotton. The auditory meatus should be treated in a like manner when involved and the patient placed at absolute rest and quiet in a dark room and special attention given to his assimilative and eliminative functions.

Fractures of the inferior and superior maxilla by both bullet and shrapnel are numerous and extremely complicated, being either compound externally, or towards the mouth, or both. These fractures are almost always multiple, causing great deformity and severe nervous complications. In shrapnel injuries parts of the chin or lower jaw are usually torn away exposing the tongue and pharynx. To administer first aid treatment to these cases you can often, applying sterile compresses, simply tie the mouth shut, using the upper jaw as a splint and support in this position by the ordinary four-tailed bandage fitting beneath the chin.

Bayonet wounds were more commonly met with on the Russian front and were often accompanied by great systemic reactions. One poor fellow, a Hungarian, was

brought in with such a wound directly above the left eye penetrating the frontal sinus and completely severing the optic nerve of that eye. Another thrust penetrated the antrum of Highmore below the right eye just escaping the infra orbital foramina causing but a slight impairment of sight of that eye with acute developing otitis media and suppurating adenitis. I was surprised to find an assistant of one of the largest surgical clinics in Vienna treating this by irrigating the suppurating ear with full strength H<sub>2</sub>O<sub>2</sub>. This I stopped, and by applying dry dressings of cotton soon gave relief from pain and suffering.

The high mortality in penetrating wounds with fracture of the skull is due, without doubt, to the lack of proper facilities for transportation and the long period that consequently elapses between the time of receiving the injury and the time in which it is operated upon. In this interval—sometimes as long as five days—inflection develops with severe attending convulsions, internal hemorrhages, coma and death.

In one of the largest clinics of Vienna, the mortality ran as high as 89%; in another 78%. In Budapest, however, it dropped to 65%; while still nearer the front, in Miskolcz, Kolomea and Krakow it went still lower to 52%.

Transportation of the wounded and immediate care is of the highest importance and the greatest care of the medical authorities. Operations performed under primitive conditions as those performed by the regiment surgeons, who at times are forced to work in hastily transformed stables, churches, railroad stations, sheds and cars, cannot be censored or criticized, or expected to produce results other than those following temporary relief.

Wounds of the head or cranium occur in

the ratio, to other wounds, of the body as 1-20 and are more commonly met with in the trench form of fighting, although shrapnel plays a big factor in their etiology, especially upon the Russian front. The first aid treatment in these cases is confined principally to stopping of the hemorrhage, treating the shock and binding the head, after it has been cleansed as well as circumstances will permit, in a skull-tight bandage secure enough to remain in position during transportation, until a suitable operating hospital is reached where after care can be administered.

Vertebral fractures and injuries are rarely cared for at all because of the detrimental results attending the transportation, jolting and jarring of these cases. To remedy such, in fact, the greater part of the evil resulting from poor transportation, motor operating field theatres have been devised that can and do go directly to the firing line, thus enabling major operations to be performed almost immediately after the wound is received.

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## WHAT THE GENERAL PRACTITIONER SHOULD KNOW ABOUT DISEASES OF THE EYE.

BY

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The healing art as a result of the rapid progress of medical science is to-day divided into different branches. Each of these branches constitutes a specialty to which some men in the profession devote their time and energy. In fact, specialization to-day is a necessity. No man, however great his mental faculty; however endowed with

intellectual powers, can grasp the science in its entirety; no man can conscientiously advise and successfully administer to all the ailments that human flesh is heir to. The general practitioner if he is studious and sincere in his professional vocation may and does have a general view of the entire domain of medicine and its underlying basic principles, but dexterity in the execution of certain methods of treatment in special cases is the privilege of the specialist. It is obviously impossible for the general physician to have a clear understanding in the ophthalmic branch of medical science, it is however necessary that he should have some knowledge on the subject, in order to be able to differentiate the simple from the more serious conditions of the eye, and at the same time, realize his own limitation when dealing with ocular diseases. It may be stated axiomatically that no general practitioner should undertake to treat an eye condition that endangers sight. These cases should be treated only by those who because of special and prolonged training have qualified for that particular work. In every community of considerable size there are one or two ophthalmologists who have perhaps sacrificed their general practice and are able to better serve the interest of the patient with ocular trouble.

#### OPHTHALMIA NEONATORUM.

The most important disease of the eye that the general practitioner should be familiar with is ophthalmia in the new born baby. This disease comes usually under his care first and he must be able to appreciate the gravity of the situation and realize the necessity for prompt action. Ophthalmia neonatorum is still responsible for 25% of the blind in various institutions and there is no doubt that about 20% of these could

have been saved by prompt early and energetic treatment by a skillful ophthalmologist. Failure to apply prompt and vigorous treatment always spells danger to the child's eye. It is true that not all the conjunctival inflammations in the new born are of gonorrhreal origin, yet it is wise from the clinical point of view, to regard them as such, whenever a conjunctival discharge appears in the eyes of the new comer. Should the general practitioner treat these cases or should he refer them to one of his colleagues working in the field of ophthalmology?

The answer to this question depends largely upon circumstances. In large cities where there are specialists doing exclusive ophthalmic work, the safety of the community, the interest of the child, demands that this disease should be treated by the specialist. There is no doubt that in the hands of the specialist the percentage of blindness would be reduced to a minimum. In small places where specialists are very rare, the physician is of course justified in treating these cases, but he should familiarize himself with the necessary technic and be prepared to treat complications as they arise, or still better try to prevent them. Wherever possible the physician should have one or two consultations during the course of the disease. The general practitioner should not rely upon his limited resources at the possible expense of the child's eyesight. Neither is it advisable for him to wait until corneal complications develop. It is much easier to prevent corneal complications than to cure them.

#### CATARRHAL CONJUNCTIVITIS.

The acute catarrhal conditions of the conjunctiva always consult the medical man first, and he should be able to differentiate them from the more serious conditions of

the cornea. The diagnosis of a severe form of conjunctivitis and its differentiation from a mild corneal affection is not always easy and the physician should bear in mind the cardinal principles of corneal inflammations so as to prevent unnecessary delay in treatment. Failure in applying prompt remedial agents causes unnecessary pain, prolongs the course of the disease, and reduces temporarily the earning capacity of the patient. The general practitioner in attempting to treat these cases should be sure of his diagnosis. This cannot be taught theoretically or didactically; this must be acquired by practical experience in eye dispensaries. Not infrequently patients come to us with corneal inflammations which have been treated by the general practitioner with some eye lotion and a yellow oxid ointment. That this treatment was of no avail is self evident, but it is essential to impress the physician with the fact that he has done considerable harm to the patient in prolonging his suffering and interfering with his earning capacity.

#### DIAGNOSING AND REMOVING FOREIGN BODIES FROM THE CORNEA.

Every physician should try to acquire the ability of treating foreign bodies of the cornea, for he is very often consulted by patients, in fact these cases rarely come to the ophthalmologist unless the condition has been complicated by the trauma made by the general practitioner in his effort to remove the foreign body. Foreign bodies must be removed gently so as not to destroy the corneal epithelium. Where the foreign body is deeply imbedded and requires a corneal spud for its removal the after treatment is an essential factor in relieving pain and restoring the eye to a normal condition. It is essential for the prac-

titioner to be able to differentiate between a foreign body imbedded in the cornea or pigmentary remnants that are usually seen after an imbedded foreign body has been removed. An overzealous attempt to remove such pigmentary deposit always adds to the trauma and gives rise to severe pain. These patients need local treatment rather than instrumental efforts in removing the mistaken foreign body. Atropin with cocaine, hot compresses and bandaging the eye is necessary to give relief and bring about a cure. In large cities these cases should be referred to an ophthalmologist.

#### GLAUCOMA.

Every practitioner should be able to recognize an acute glaucoma, for in this disease, early recognition means a cure; late recognition means blindness. These cases consult the family physician first, and he must be prepared to give proper advice. Often these cases begin with a chill, some rise of temperature, severe headache radiating along the course of the 5th nerve, nausea, dizziness and even vomiting. The physician not infrequently is misled in thinking that he is dealing with some acute infectious disease, treats it as such, for two or three days, before the ophthalmologist is called in, and of course the sight by that time is practically gone beyond our power of restoration. Several such cases have come under my care. In communities where the general practitioner has to treat eye conditions he should acquaint himself with the various points that will differentiate acute glaucoma from an iritis. This is a very essential point for a mistake in the diagnosis may mean blindness to the patient. Atropin which is usually the reliable remedy in iritis is absolutely contraindicated in glaucoma. The points to remember are that acute glaucoma is usually found

in patients above the age of forty, that the patients see a rainbow of colors through hazy cornea when they look at artificial light, that the pupil is somewhat dilated and that the tension of the eyeball is increased.

#### PUPILLARY REACTIONS.

One important point in pupillary reactions which the general practitioner should know. It is manifestly impossible for him to know all the intricate paths of the pupillary reaction arc, neither is it always possible for a busy physician to examine for accommodative defects. It is however not only possible but also desirable that he should examine the pupillary reaction for light. It is easy after a little practice to observe whether a pupil reacts to light or not. An absolute rigid pupil that will not react to light is almost a sure diagnostic symptom of syphilis. So is an Argyl Robertson pupil diagnostic of tabes. The various types of pupillary defects are not essential for the general practitioner but he should as a routine matter examine the pupillary reaction to observe any rigidity. All my cases with absolute rigidity of the pupil and somewhat irregular shape, have on serologic examination given a positive reaction i. e., + 4.

#### EYE STRAIN.

It is also important for the general practitioner to know and bear in mind the baneful effect of eye strain upon the human organism. Headache, dizziness, vertigo, nausea and vomiting and the subsequent neurotic states are to-day known in a large percentage of cases to be caused by errors of refraction. The physician can serve the interest of his patients, by timely advice to correct such errors. Should the general practitioner refract these cases? In small communities yes; in large communities no.

Refraction is a science and an art and requires special skill and patience, which the general men cannot possess. Besides in large cities the patients are already informed that the specialist can do this work better than the family physician and they may lose confidence in his honesty if he attempts to do things not within the scope of his field of endeavor.

917 Spruce St.

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### SOME OF THE PRINCIPLES UNDERLYING THE TREATMENT OF PEPTIC ULCER.

BY  
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In recent years, much has been written about the treatment of ulcers of the stomach and duodenum. Views have been expressed by surgeons and by internists and it has become almost true that there are two schools—a medical, and a surgical—each criticizing the other, and finding flaws in the results of treatment as carried out by the other school.

It appears to me that there is a common ground on which all can meet and agree. To find this, we must go back as it were to first principles—to the actual result we hope to accomplish; namely, the healing of the open peptic ulcer.

Many medical treatments have been advocated—based on as many various principles. Some men, for instance, have felt that rest of the stomach and duodenum is all important; others, that the mechanical scraping of food across the ulcer must be eliminated; still others, that the ulcer can not heal because its edges are more or less fibrous, and the blood supply deficient; and

still others maintain that micro-organisms in the ulcer walls prevent healing by continued growth, toxin formation and resulting tissue destruction. On the above various principles, such treatments have been instituted as rectal feeding, administration of soft foods only, etc.

On the other hand, many surgical procedures have been advocated. These have been based mostly on the operation of gastroenterostomy—a mechanical device evidently based on the principle that the stomach could be made to empty itself at once and the ulcer therefore "sidetracked." Out of this original operation, have evolved all the various modifications, such as anterior gastroenterostomy, posterior gastroenterostomy, pyloroplasty, pyloric occlusion and others; and with these modifications have come such terms as "immediate drainage," "sidetracking the ulcer," etc. All the above medical and surgical procedures have had a certain number of cures, or at least cessation of symptoms. But the failures recorded have indicated that there is some principle not sufficiently recognized in treating the open peptic ulcer.

Let us consider how an ulcer is formed. It is generally recognized that the steps are about as follows:

First, one of the terminal arteries supplying the mucosa becomes occluded, as a result of thrombus formation, embolism, arteriosclerosis, or possibly trauma. The exact etiology here is still obscure.

Second, the portion of mucosa supplied by this arterial twig becomes ischemic and then necrotic.

Third, the gastric juice digests away the ischemic portion, leaving a raw surface, sharply limited, as a rule, to the area of distribution of the artery occluded.

Now why does this ulcer not heal? In

all the above medical and surgical treatments, the one prime factor—the condition which makes ulcer in the stomach or duodenum different from ulcer elsewhere, seems to have been overlooked—namely, the peptic power of the normal gastric juice. Granulation tissue tends to form here, as elsewhere, but is constantly interfered with, by the corrosive peptic power of acid gastric juice. If this digestive action is removed, then the ulcer heals or tends to heal. Pathology gives us evidence of this. Peptic ulcer causing symptoms is practically never seen in achylia gastrica. Why? Because if ulcer forms it is not subjected to corrosion and it heals promptly, there being no free acid in the stomach. Furthermore, ulcers on the lesser curvature or posterior wall, or any other portion of the stomach not associated with pyloric obstruction, often heal with few or no symptoms and their scars are found at autopsy. Why? Because the period of corrosion by free acid is so short as compared to the period during which the ulcer can heal uncorroded, that the reparative process predominates. The best treatment of any peptic ulcer is that which most effectively controls or reduces the period of corrosion.

Let us consider for a moment, the normal physiology of the stomach. A meal is eaten. In response to this food-taking, a secretion of acid and pepsin is poured out by the glands of the stomach mucosa. This secretion is mixed and churned thoroughly with the food by the peristaltic action of the stomach, and the food combines with the acid as formed. After a period averaging perhaps one to two hours, the food becomes saturated, so to speak, with acid, and as the glands continue to secrete, free acid is found in the stomach. The stomach then gradually empties itself of all food and secretion, in

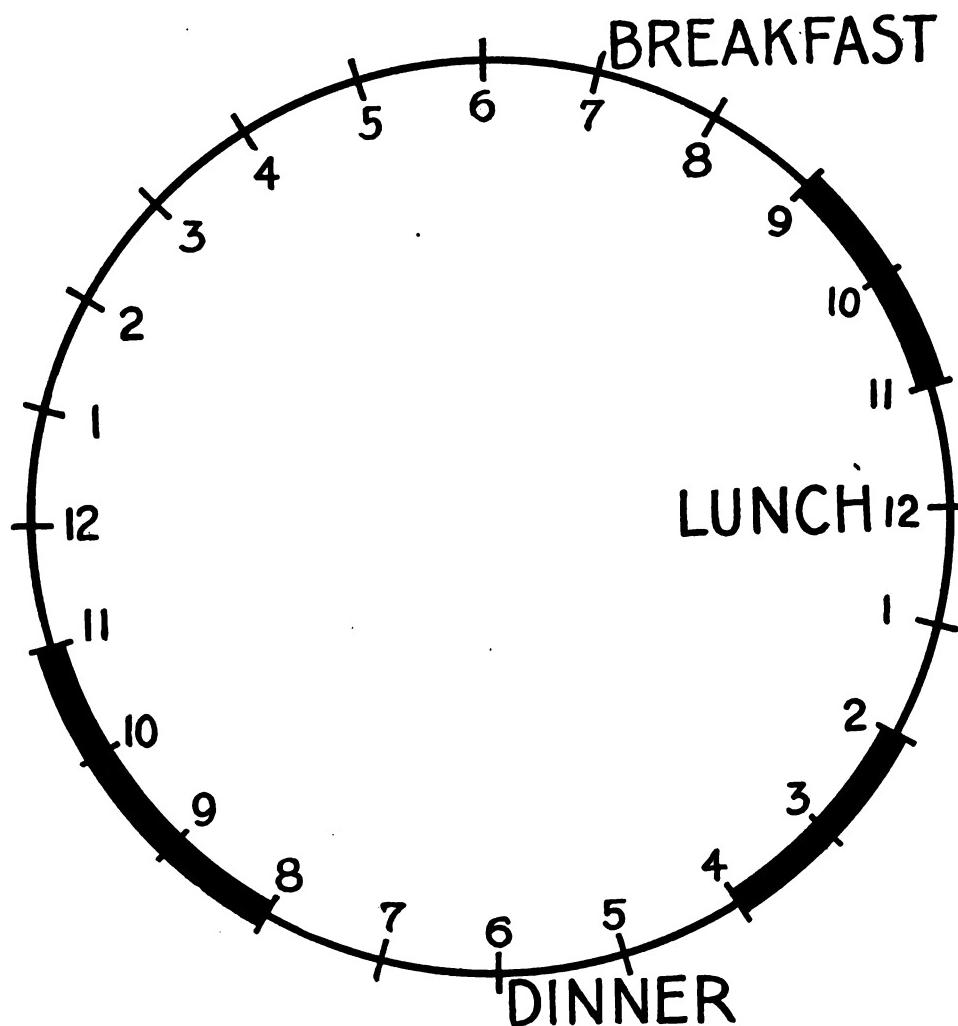


FIG. 1. Schematic representation of the periods of *free acid* in the stomach during 24 hours, in the non-obstructive type of peptic ulcer, i. e., where no pyloric obstruction is present. The heavy shaded portions represent the free acid periods following average meals at 7 A. M., 12 noon and 6 P. M. Total acid peptic corrosion 7 hrs., non-corrosion 17 hrs., during the 24 hrs.

about four or five hours. During this time, then, free acid has been present for a period of two or three hours, as a rule—depending of course on the type of food taken and the amount. Under normal conditions, with the mucosa intact, no symptoms are noted during this free acid period.

Now, what occurs in ulcer cases? We have at once to consider two types of peptic ulcer—those not associated with obstruc-

tion at the pylorus—and those associated with obstruction. Ulcers at, or near, the pylorus either in the stomach or in the duodenum are usually complicated by pyloric stenosis and therefore obstruction. The ulcers which are usually not associated with obstruction are situated on lesser curvature, posterior wall, or fundus—i. e., in some position removed from pylorus.

Considering first, non-obstructive ulcers,

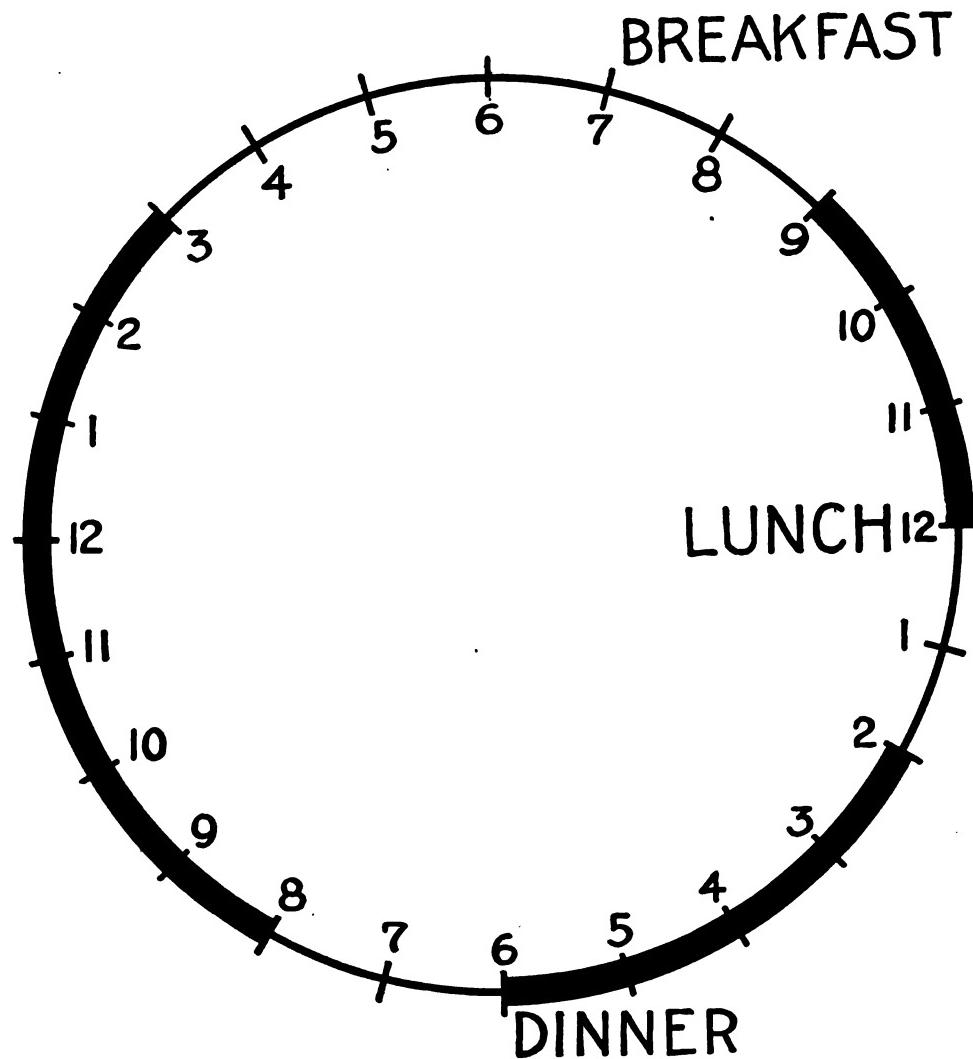


FIG. 2. Schematic representation of periods of *free acid* in pyloric obstruction cases of peptic ulcer. Free acid present from 9 A. M. (2 hrs. after breakfast) and 2 P. M. (2 hrs. after lunch) up to time of next meal. At night, free acid present up to 3 A. M. (this time varying for different degrees of obstruction). Total corrosion from free acid peptic gastric juice, 14 hrs., non-corrosion 10 hrs.

we see that most of these heal. "Dead-house" pathology reports large numbers of scars or open ulcers in the stomach proper, where no symptoms have been elicited during the life of the patient. Why have these healed? A consideration of Fig. 1 will show. There is free acid with corrosion of the ulcer in the shaded areas and depending of course on the type and amount of

food taken, the periods of corrosion vary from one to three hours after each of the meals—making a total of three to nine hours during the 24—and leaving a period of from 15 to 21 hours when the ulcer can heal. It is this type of ulcer that is so commonly found healed at postmortem without having given many symptoms—at times even being entirely latent. Many of these ulcers are

diagnosed hyperchlorhydria, dyspepsia, chronic gastritis, etc., because of their comparatively mild symptoms.

On the other hand, let us consider the obstructive type of ulcer. As mentioned above, it usually lies just within, or just without the pylorus—at times in the pyloric ring. By its irritation, its infiltration and perhaps by its peritoneal involvement, the pylorus becomes occluded to some extent—depending on the severity of the various factors. The stomach therefore retains food and secretion abnormally long—the glands continue to secrete acid and pepsin—and a high acidity develops. This continues to such an extent that the stomach does not empty itself all day—and in the extreme cases all night. These ulcer cases are the chronic recurrent ones as a rule. The ulcer never gets a chance to heal fully because of the continued corrosion. Let us illustrate this by Fig. II. Here we see that the period of corrosion during the 24 hours is longer by far than the period when the ulcer can heal uncorroded.

Before considering the best treatment, we must recognize one more factor. Pyloric obstruction is of two kinds—the so-called spasmotic type—and the actual cicatricial narrowing from old scar or adhesions. If we give an obstructive ulcer case a motor meal of food, at the end of seven hours (an arbitrary time), we can aspirate varying amounts of food and secretion. If we now put this case at rest, give frequent feedings of soft food—and accurately control the acidity day and night for a period of two weeks or more, a second motor meal will give different results. In about 80 to 90% of these cases the pylorus will have opened up to some extent and much smaller amounts of residue will be obtained by

aspiration after seven hours. Such cases may be termed spasmotic pyloric obstructions. In the other 10 to 20% of cases there will be no material decrease in the amount of residue after the second motor meal—that is, the pylorus remains fixed and of small aperture. These cases may be termed the cicatricial pyloric stenoses.

Let us now apply these principles to the medical and surgical treatments. Surgically the average ulcer treatment is gastroenterostomy—too often done without definite indication. What does it accomplish? In the non-obstructive cases, nothing. A gastroenterostomized stomach does not empty any sooner than normal time. This has been proved repeatedly. The hope for "immediate drainage" was unfounded. The stomach is not simply a "bag" or a "funnel," but is a muscular organ with peristaltic movements. Furthermore, after gastroenterostomy, the majority of the food goes through the pylorus and not through the stoma. This has been shown by X-ray. The period of corrosion of the ulcer therefore is in no material way influenced by the operation in such cases.

In the obstructive cases there is some indication for the operation. But even here the average operator works without regard as to whether the obstruction is spasmotic or actually cicatricial. By doing the operation, he accomplishes what, as to the corrosion of the ulcer? He reduces the obstructive ulcer to the same conditions for healing as the non-obstructive—that is, he allows the stomach to empty in normal time—the excessive periods of free acid peptic corrosion are eliminated—and in the majority of cases the ulcer heals. The patient has however been subjected to the mortality incident to gastroenterostomy—a considerable figure even in the best clinics.

Let us consider what can be done medically. If we bear in mind that our aim is to reduce the acidity and therefore reduce the peptic power of the gastric juice, it will at once become evident that frequent small feedings will help—and that alkaline powders, such as magnesia, bismuth, and soda bicarbonate can be used to neutralize the acid as it is formed.

Reduced to a practical basis, it has been found that feeding every hour with small amounts of milk and cream, cereals, soft eggs, etc., and giving sufficiently large powders of the alkalis halfway between feedings, all free acid and therefore all corrosion of the ulcer can be eliminated entirely. In the non-obstructive cases, the naturally favorable conditions are made more so, and even the small period of corrosion is done away with. In the obstructive cases the corrosion time can be eliminated also, but in such cases, to ensure non-corrosion during the night, the contents should be aspirated at 9.30 or 10.00 P. M., and in cases of continued secretion, again at midnight with administration of sufficient alkali to neutralize the excess acid formed. As above stated, the majority of such pyloric stenoses will open up under this soothing management after a period of 2 or 3 weeks, and the night aspirations can be discontinued. The 10-20% of actual cicatricial stenoses however remain closed. If continued indefinitely, medical treatment can keep such patients comfortable if sufficient nourishment can pass the pylorus. These conditions are hard to control, however, indefinitely, and it is these cases in which gastroenterostomy is indicated—or some other device for allowing the stomach to empty in normal time. Even after such operative procedure, however, we must remember that the original open ulcer remains, unless excision is done,

and that we can assist its healing by accurate medical management.

In speaking of the above medical treatment, I wish to emphasize its accurate technic. I do not refer to the average slipshod irregular medical treatment for 2 to 3 weeks with immediate return to general diet. Properly conducted, medical management of ulcer should consist of accurate acid control, frequent small feedings of soft foods—and rest in bed for 3 or 4 weeks—followed by a long period of acid control or reduction as accurate as is possible.

#### Conclusions:

1. That treatment which most effectively reduces or eliminates the corrosive power of the gastric juice is the best treatment for peptic ulcer.
2. Non-obstructive ulcers and ulcers with complicating spasmodic pyloric obstruction should be treated medically.
3. Ulcer cases complicated by cicatricial anatomic pyloric stenosis should be treated by some procedure such as gastroenterostomy followed by a period of accurate medical treatment.

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## OFFICE TREATMENT OF VARICOSE VEINS.

BY

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In reference to the technique of a method, already described in AMERICAN MEDICINE, the writer wishes to say that experience has proved to him the difficulty of explaining a simple manual operation, by means of unclouded words. It is easier to alter or simplify a technique, or even to change it

altogether and substitute another, than it is to convey certain facts without ocular demonstration. Those who are unaccustomed to expedients which are indispensable when employing thick, heavy solutions when administering them by means of the hypo-syringe, cannot control Shuford's solution. In the hands of such, more of it is likely to fall upon the floor than to reach a predetermined destination.

Artillery-makers employ the retarded flow of glycerin to take up the recoil of a cannon; but some physicians insist on attempting to force it to flow rapidly through a fine needle. One of these two views is wrong, consequently, instead of insisting on either one, the writer has adopted the belief that constant and certain failures will originate in the nervous systems of some administrators, unless an aqueous solution be substituted for a glycerinated one. Zinc sulphat gr. x, acid carbol.  $\frac{3}{ss}$ , spts. camphor, alcohol aa  $\frac{3}{i}$ , aq. q. s. ad  $\frac{3}{i}$  is such a substitute. It will flow readily, is manipulated easily, will yield results equal to those obtainable with Shuford's solution and will do this no matter how nervous or impulsive the operator may be. It is so thin that it would tend to make impatience become less hasty and begin to take pains.

A first essay should be made upon large superficial and visible veins. Select such a vessel, transfix it with the syringe-needle, endeavor to inject one drop just beyond the distal wall, a second drop should be placed within the lumen and a third should be deposited on this side, or just outside, of the proximal wall. Then, with a slow rotary motion, withdraw the needle. With no more than five drops in the syringe one may hardly go far astray unless he fails to drive his needle deep enough and therefore makes a sub- or intra-dermic deposit, in

which case the skin may be destroyed and the vein may escape destruction.

Fold over and over (three or four times) the end of a two-inch bandage, thus making a square pad ( $2 \times 2$ ). Upon this make a few turns of the bandage and fasten all with a strip of adhesive plaster ( $12 \times 1$ ). The latter should be held at each end with a corresponding hand and its center (between the extended and separated hands) should be pressed directly down upon the pad; because direct pressure is desirable, but the sideway pull or torsion as found in a "round and round" bandage is apt to ensure failure. The vein must be closed and a few days' adhesion should maintain the stoppage. The plaster being outside of the bandage, does not come in contact with the skin, therefore plaster-eczema, or pent up perspiration or similar sources of infection are avoided. Let it remain in place one week. If the patient lies upon a couch with his foot elevated or if he sits in a chair with his foot upon a table, then hemorrhage is negligible. But in any event, pressure of some little duration and made with a sterile wipe, will always control matters.

If the attendant is not entirely in sympathy with and is unwilling to abide by the laws and regulations governing the so-called "antiseptic or aseptic technique" then he would be wise indeed to have nothing whatever to do with varicose veins. For small as is the field, its possibilities for evil are immense. Fortunately, nothing wrong will happen save as the result of a blunder; but to avoid such a blunder requires quite as much vigilance in maintaining a surgically clean operative field as does a laparotomy or any other operation.

Perhaps one of the commonest sources of trouble is the relief which is often felt after the first treatment. This arouses the

enthusiasm of the patient's relatives and friends, who combine to urge "haste and yet more haste." The result of yielding to solicitations, for two or three injections at a sitting, is that all parties have increased respect for the old English proverb, "The more haste the less speed."

It is the writer's intention to write another brief article upon after-treatment and similar matters, possibly entering upon the subject of ulcers, eczema, etc., with the management of the same conditions. This seems to be in a very unsatisfactory state—in certain quarters, at least.

However, this present writing answers the questions which have been sent from London, from San Francisco and from various places "betwixt and between"; but all based upon the preliminary reports.

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## PREPAREDNESS.

BY

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In these days of war, and near war, we hear much of preparedness and this very frequently awakens us to the fact that we are not prepared for things of peace.

For a good many years we of the medical profession have gotten out of the habit of preparing to fight our battles with disease. That is, we have neglected the study of our ammunition—our therapeutic agents. With the closing of importation of the many drugs and chemicals from foreign countries many of us found ourselves practically without those things which we had concluded were the best and most needed and not having given attention and study to our do-

mestic remedies, have been at a serious loss to know just what to do or where to turn.

Many of us had formed the habit of condemning everything, or almost everything, in the way of American drugs. We had about reached the conclusion that few, if any, American plant drugs were worth while and had turned our eyes to the European synthetics. Coal tar formed the main base of any number of the things which we thought we could not get along without and, when the embargo on these agents was enforced we were much like a ship without a rudder—we found ourselves beating from shore to shore and unable to make snug harbor.

There were many things which could be made in America as well as in a foreign country, but our laws allowed the patenting of foreign products, thus giving them a monopoly of the market and making it absolutely impossible for the American manufacturer to make or market a similar product under its true chemical name. We have already felt the effects of this condition and our people have suffered, and greatly, because of the fact that we have not protected ourselves and been prepared for just such an emergency as exists today.

One of the things which interferes with preparedness is the attitude taken by some self-styled leaders of the American profession. A few years ago, when salvarsan was first brought forth by Ehrlich, these leaders, basing their ideas upon the reports of the discoverer and a few investigators, heralded the fact that this agent was a *cure* for syphilis. In a short time it was found that arsenobenzol was not an absolute cure and that it had to be bolstered up with mercury in one form or another. With the coming of the war and the cutting off of supply of this agent, both in America, Eng-

land and France, a like product was made in the two latter countries, as well as in Canada. I have said a like product, but it is claimed by the manufacturers of all three countries that their product is identical with the original salvarsan. When the leaders mentioned above are asked about these other than German products they practically advise against their use. There is no secret as to the process of manufacture of the German salvarsan and there is no reason why any properly equipped chemical house should not manufacture the product. Were it not for the existing patents, it is very probable that every American chemist would be offering an arsenobenzol of his own make, and equal to the German product in every way, to the American profession, and possibly at a cost far lower than that of the imported article. Were it not for the conditions as they are, we would not be crying for lack of this rather important agent.

Time was when we thought that America could not produce a digitalis worthy of use and that we must depend upon the foreign countries for the active principles of this plant. Now we know that a plant, equal in every way to the English, is grown in America and that we have manufacturers in this country who are making equally as good and active principles thereof as were ever produced in Germany or elsewhere. It may not be generally known, but one American manufacturer, at least, has been furnishing considerable amounts of digitatin and other digitalis principles to importers of this class of drugs, who could not obtain supplies from their European correspondents.

Practically all of the coal tar products have advanced in price and for the simple reason that we have depended upon Ger-

many in the past for the basic materials from which to make them. Synthetic salicylic acid is practically out of the market, and for the simple reason that phenol is not manufactured, to a large extent, in America. And there should be absolutely no reason why these things should be as they are. Coal tar is produced in immense quantities in this country and much of it is allowed to go practically to waste. It has been said that the Germans were prepared to make the basic materials. Why not the Americans? To be sure, it costs something to prepare for such things, but the cost of unpreparedness is far in excess. That our chemists of America could make all these various coal tar basic products is beyond question, as I am reliably informed that not a single manufacturer in this line has not, at one time or another, in an experimental way, made everyone of them. But it was cheaper to get the crude materials from Germany, or elsewhere, so why should we spend a cent in preparing to make them ourselves? Now it is very apparent why we should have done so long since. Had we been making our own phenol our salicylic acid factories would be running with full force of workers, if not more, and we would not be paying double, treble or quadruple the real cost of the product.

The bromides have gone from about 30 cents per pound to over \$4. This not for lack of the crude bromine, but because of the fact that we Americans have not looked to the production of potassium and sodium, the former in particular, and have depended almost wholly upon Germany. We have bromine and to spare at Midland, Michigan, but we have not sufficient visible potassium and we must pay dearly for those products of almost daily need to everyone of us. It is possible that the sodium salt should not

have risen as high as the potassium, but the handlers of the bromides have taken advantage of the situation and are no doubt endeavoring to cover the losses sustained by forcing up the price of the article which might remain comparatively low. Here is another instance wherein a lack of foresightedness on the part of the American has injured everyone of us—the physician as well as his patients.

Quinine is another drug which has increased in cost to a very considerable extent and all because of the fact that we have come to depend to so large an extent upon the European manufacturers for our supplies thereof. Time was, and less than half a century ago, when America produced the bulk of the quinine of the entire world, but it could be made for less money in Germany, *so why should we make it on this side of the Atlantic?* The crude bark is almost, if not equally as easy of purchase at present as it was prior to the war, as none of the countries producing it are, to any great extent, involved in the struggle. It could be brought to this country by ships of neutrals and thus be delivered with little or no interference. But the American manufacturers have turned their attention to something else giving greater profit, presumably, and depended upon the foreign makers for their supplies of this drug. Of course the armies in the field are making a greater market for quinine, but were it made, as of yore, in large quantities in America, the Americans would not be paying the present great price for it. Just another demonstration of the lack of preparedness.

And then the American doctor has failed to study his domestic drugs to a sufficient extent. He has relied upon this, that or the other highly lauded foreign production

and has employed it to the almost utter extinction of the active drugs of domestic production. He has given so little attention to the latter as to hardly know of their actions or applications. Ask the average American physician the action and use of some very common plant drug and he will very frequently tell you that it *would require large books to cover all that he does not know and that a single sheet would be sufficient to hold all of his knowledge thereof.* And the leaders (self-made) of the profession are forever impressing upon the minds of the American physician the fact that this, that or the other domestic drug is either inactive or too active and that but very few of them are really worth while, while on the other hand they have and still are telling us that most of the foreign made drugs are really worthy—much better than those of domestic production.

We of the regular school have been too narrow and hide-bound in our ideas of therapeutic agents and have very frequently, sad to tell, either failed or refused to listen to our brothers of the other medical sects. We have ridiculed many of their ideas, but now, in the emergency are more than willing to give them a listening ear, and we are getting much valuable knowledge from them, especially as concerns our American plant drugs. Time was when we scorned lobelia, but now, in the absence of a foreign produced antispasmodic and relaxant, we are turning to the whole plant lobelia, or its alkaloid lobelin, and finding that, properly employed and according to indication, it is something of much value. We no longer poke fun at the eclectic because he told us that lobelia was worth while as much as half a century ago. Time was when we thought we must have the salicylates in every case of rheumatism, but now we find,

in many instances, that colchicum and its alkaloid, colchicin, do good work in this condition. We also find that cimicifuga and its resinoid, macrotin, likewise do well in certain cases of rheumatism. That is, we who have given any study to plant drugs, have found this out.

The facts of the matter are, that as we go though the list of American plant drugs, or those which could well be produced in this country, we find that many may, and undoubtedly will, replace many of those of foreign production or manufacture. We will find that, in the control of fever, aconite and its alkaloid, aconitin, and veratrum and the alkaloid, veratrin, will displace the coal tar antipyretics very nicely and it is my belief that there will be fewer of the latter and more of the former employed as time goes on and the physicians become educated to their applications. The self-made leaders of the profession will tell you that aconite is uncertain in the galenic preparations and that aconitin is too potent, but we who have employed the latter, *properly*, have had no cause for worry, not for a single instant. It is true that it is a potent agent. So are strychnin, morphin and host of other drugs in everyday use. If aconitin is employed in the same rational manner as the other drugs mentioned, and absolutely according to indications, there is no reason in my mind why it should not be as of the same universal application. When the physicians learn the method of small dosage of the potent drugs they will become of greater use and wider application. And I know they will give astonishing results.

If we do not, like the American Navy, want to go into battle practice with a lack of ammunition, we must study well those drugs produced in America or others ob-

tainable from those countries not at war. We must, if we would be prepared, give close study to every remedy offered, and no matter if the self-styled leaders raise objection to the use thereof. These men are no more infallible than are you or I and there is every reason to believe them in error at times. To be prepared one must rely upon his own guns and the guns of the physician are his own personal knowledge of those things which he employs in the relief of the sick. If he sees that a drug, even one of those taboo, gives results, he is perfectly justified in its use, and that regardless of that which may be told him by others. His own experience is worth something and it leads to a better preparedness on his part. If we all gave more attention to the things happening within our own field of observation, our successes would be greater and those who depend upon us would fare much better. The close study of drugs as a whole would add greatly to our store of ammunition and we would go into battle practice able to score a greater number of hits than has been possible of recent years. There would be fewer and fewer of the therapeutic nihilists and finally they would disappear completely. Team work is as necessary in the preparedness of the American medical profession, as in the American Army or Navy, and there has been too little of this in the former. If the man in the ranks in either the Army or Navy has something to offer which will further the idea of preparedness, he is given a listening ear by his superiors. Not so in medicine. Unless a man is recognized as an "authority," what he may offer is very frequently made the butt of ridicule, until the time has about come when he of the ranks thinks long before giving utterance to a single idea, and that no matter what

may be his fund of information. To be prepared to fight against disease, and that properly, we must give ear, even to the lowest member of our ranks, as it is a well-known fact that, without an exception, all of us discover something with more or less frequency, that is unknown to the rest. As Roosevelt says, "There can be no real preparedness to perform our duty in time of war unless there is preparedness to do our duty in time of peace," and this holds good with the medical profession as well as with the Army or Navy. While we are waiting for this case or the other to come to us, let us study well those things which will prepare us to cope with that which we meet, else the enemy overcome us and death, or worse, occur. Such is real preparedness.

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### AN INTERESTING OBSERVATION IN THE DIAGNOSIS OF INCIPIENT APICAL PULMONARY TUBERCULOSIS.

BY

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The writer has noticed many times that in incipient apical pulmonary tuberculosis one of the first signs observed is the presence of a soft systolic murmur heard at the apex of the heart, that is at the mitral valve, a functional murmur. Accompanying this murmur is congestion of various degree heard with the stethoscope over the apex of the lung and generally the left one at that.

Now many young men who have apical pulmonary tuberculosis have as a previous condition hypertrophy of the left ventricle due to arteriosclerosis, straining or exercising in athletic sports, straining or heavy lifting in their occupation, or as happens

many times, the hypertrophy is the result of metallic poisoning from the ingestion of poisons in their daily trade or vocation.

When such a case is found, that is hypertrophy of the left ventricle, systolic functional murmur, and congestion of an apex, an interesting proposition presents itself. Is this murmur a functional murmur? Then the condition is pulmonary tuberculosis, for localized congestion of an apex under such circumstances means tuberculosis of that apex. If the murmur, however, is an organic murmur, that is a mitral insufficiency, then the congestion of the apex as a rule is not tubercular but is the result of the murmur.

The text-books are strangely silent on these points. From reading them one would draw the conclusion that congestion of lungs resulting from an organic murmur is generally at the base of the lungs and not the apices. In practice, however, a very frequent observation is the presence of a mitral insufficiency and congestion of an apex of the lung.

Now it has been found that when a patient has a mitral insufficiency, such patient will very seldom have pulmonary tuberculosis with it; the reason probably being that the tubercle bacilli will not find the apex good ground for growth as there is too much circulation of blood present in the congestion due to a murmur.

Listening for the murmur at end of inspiration, or at end of expiration, as some writers suggest, will not help one in solving this interesting problem suggested by the heading of this paper and in deciding as to whether the murmur is functional or organic. Of course, if the disease has progressed far enough, and tubercle bacilli are found in the sputum, there the laboratory can make the diagnosis for us. But the

writer speaks of those incipient cases where, of course, no bacilli are in the sputum. How about these cases? How is one to know whether the patient has a heart lesion or pulmonary tuberculosis. The writer would suggest the following points as being of great value in helping to come to a satisfactory determination.

Examine both pulses in radial arteries of the patient. If both pulses diminish or are absent when arms are held in upright position compared to arms held in horizontal position, in majority of cases, the trouble is one of mitral insufficiency because the diminution of pulses shows weakened myocardium. If only one pulse diminishes or is absent, we may suspect, as a rule, tuberculosis of the apex corresponding to the pulse; this phenomenon being probably due to pressure effects of an incipient pulmonary tuberculosis. Further, the presence of a morning chill, constant afternoon temperature and if the case is far enough advanced, night sweats, is sufficient to help in diagnosing tubercular congestion from that due to organic murmur of the heart.

In this connection the writer wishes to thank Adj. Prof. R. Abrahams for the pulse phenomena mentioned in this article, and moreover thank Prof. Ed. Quintard as medical director and also Prof. A. F. Chace and Adj. Prof. R. Abrahams for the use of the medical clinic at the New York Post Graduate Medical School during the study of the observations mentioned herein.

124 Lee Avenue.

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**Rectal and sigmoidal cancers** are too often treated for "dysentery." An examination of the lower bowel, important in *all* doubtful cases, should never be omitted in patients with mucous or bloody discharges.  
—*American Journal of Surgery.*

## SOME IMPORTANT EVENTS IN THE DEVELOPMENT OF THE PRACTICE OF MEDICINE IN AMERICA

BY

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Washington, D. C.

According to available records, Dr. Walter Russell, who came over from England in 1608 on the "First Supply," was the first English doctor to render medical aid to

Englishmen in the American colonies. His first patient is said to have been Captain John Smith whom he accompanied in his exploration of Chesapeake Bay and the Potomac river in 1608.

It is interesting to note that the first medical publication issued in America was published in 1677 as "A Brief Rule to Guide the Common People of New England How to Order Themselves and Theirs in the Smallpox or Measles" by Thomas Thacher, first minister of the Old South Church in Boston. In this connection it may be stated that the first inoculation against smallpox was performed in America at the instigation of Rev. Cotton Mather

(1663-1728) by Dr. Zabdiel Boylston who died in 1766.

Dr. James Lloyd stands out as one of the most eminent pioneers in the practice of

DR. JAMES LLOYD

obstetrics in this country. He was born on Long Island in 1728, studied medicine with Dr. Clarke in Boston and later attended lectures in London. Probably he was the first to perform lithotomy in Boston, not in New England, and to substitute ligatures for the cautery, for the control of hemorrhage in surgical operations.

**DR. VALENTINE MOTT** One of the first writers in this country on medical subjects was Dr. Thomas Cadwalader of Pennsylvania. He wrote the "Iliac Passion" (intestinal obstruction) and other valuable works. The first American account of yellow fever was written by Dr. John Linning of Scotland, who settled in South Carolina. He advanced and vigorously supported the theory of immunity after one attack of yellow fever, and he also experimented on himself on the process of metabolism. The results were published in the Transactions of the Royal Society in 1743.

Originating in the efforts of Dr. Thomas Bond of Pennsylvania (1712-1773) the Pennsylvania Hospital—the first general hospital in the colonies—was chartered in May 1751 and was first occupied by patients Dec. 17, 1756. Its

actual establishment became possible through the generosity of the people of Philadelphia and the House of Representatives of the Province.

**DR. NATHAN SMITH**

became possible through the generosity of the people of Philadelphia and the House of Representatives of the Province.

It has been said that Dr. Benjamin Rush (1745-1813) "established more principles and added more facts to the service of medicine than all who had preceded him." Born in Philadelphia, he was graduated from Princeton, obtained a medical degree from Edinburgh in 1768 and began to practice in Philadelphia in 1769. In addition he was a member of

**DR. BENJAMIN RUSH** the Continental Congress, a signer of the Declaration of Independence, and was also surgeon-general of the Army for the Middle Department in 1776.

Dr. John Morgan of Pennsylvania is said to have been the first to restrict himself to the practice of medicine as distinct from surgery and pharmacy. He was prime mover in the establishment of the Medical School of the College of Philadelphia—the first one of its kind on the continent. He was ably assisted by Dr. Wm. Shippen. In 1791 the school was merged with the Medical Department of the University of Pennsylvania, with Dr. Morgan, professor of

theory and practice of physic, Dr. Shippen, professor of anatomy, Dr. Adam Kuhn, professor of botany and *materia medica*, and Dr. Benjamin Rush, professor of chemistry.

In speaking of medical schools, mention

**DR. B. WATERHOUSE** should be made of King's College Medical School, New York, among whose most active founders were Dr. Samuel Bard and Dr.

Peter Middleton, who are recorded as the first in America to inject the blood vessels and dissect the human body. Dr. John Jones was the first professor of surgery in that school.

Through the influence of the three doctors mentioned in the preceding paragraph the New York Hospital—the second general hospital founded in the North American colonies—was chartered in 1771.

**Dr. CRAWFORD W. LONG** It is interesting to note here that the following doctors were among the signers of the Declaration of Independence: Dr. Josiah Bartlett (New Hampshire 1729-1795), Dr. Matthew Thornton, a native of Scotland (New Hampshire 1714-1803), Dr. Oliver Wolcott (Connecticut 1726-1797), Dr. Lyman Hall (Georgia 1731-1790), and Dr. Benjamin Rush, above mentioned.

The first to introduce vaccination into

**Dr. DAVID HOSACK**, America, after the method of Dr. Jenner, was Dr. Benjamin Waterhouse of Massachusetts, who was one of the founders of the Medical School of Harvard University and its first professor of theory and practice of medicine. Under the title "Something Curious in the Medical Line," he published in the *Columbian Sentinel* in March, 1799, an account of the "new inoculation," and in June, 1800, he success-

fully vaccinated his young son, who two months later was inoculated with the virus of smallpox without effect.

Dr. Elihu Hubbard Smith (Connecticut, 1771-1798) was with Dr. Samuel L. Mitchell and Dr. Edward Miller, the projector and founder of the first medical periodical published in America, under the title *The Medical Repository*.

**Dr. E. McDowell** Among the most eminent of American physicians in the 19th century was Dr. Matthew Smith of Massachusetts (1762-1828). In 1798 he established the Medical School of Dartmouth College and was the first professor of theory and practice in the Yale Medical School.

One of the founders of the Massachusetts General Hospital was Dr. James Jackson, who shared with Dr. Waterhouse the honor of introducing vaccination to the notice of American physicians.

Special mention should be made of Dr. William Beaumont, U. S. Army, as the pioneer physiologist of this country, and of Dr. James Bigelow of Massachusetts, whose work on "Self-limited Diseases" is said to have had a great influence on medical practice. He was publisher and editor of the first edition of

**Dr. JOHN C. WARREN**

the *U. S. Pharmacopoeia*, which was published in Boston on December 15, 1820. He also published an elaborate work on American medical botany.

To Dr. David Hosack, New York (1769-1835) goes the honor of being the first physician in America to tie the femoral artery for aneurism. He was the friend and family physician of Alexander Hamilton and

Dr. Wm. T. G. Morton attended him after his fatal duel with Aaron Burr.

In lithotomy one of the most brilliant operators was Dr. Philip Syng Physick (1768-1837), a native of Philadelphia and graduate of the University of Pennsylvania when only seventeen years old. He performed lithotomy on Chief Justice Marshall, and it is recorded that he removed more than 1,000 small calculi from his bladder.

In ovariotomy the palm goes to Dr. Ephraim McDowell of Kentucky (1771-1830). He was the first to perform that operation for the removal of a tumor; and of his first seven cases it is stated that six were successful.

**DR. WALTER REED** There were many prominent medical writers in those days, among whom may be mentioned Dr. Daniel Drake of Kentucky (1785-1853) and Dr. Robley Dunglison of Pennsylvania (1798-1869), who wrote on children's diseases and was the author of "System of Physiology,"

"Hygiene," "Therapeutics," "Practice" and "Materia Medica."

Eminent as an anatomist and widely known for his contributions to medical and other literature was Dr. Oliver Wendell Holmes of Massachusetts (1809-1894.) He is recorded as the first American to maintain vigorously the thesis of the contagiousness of puerperal fever, while to Dr. W. W. Gerhard of Pennsylvania goes

the credit of demonstrating the essential difference between typhus and typhoid fever.

The first public operation under ether anesthesia was performed by Dr. John C. Warren of Massachusetts (1778-1856), and the announcement of its discovery was made by Dr. Henry J. Bigelow, also of Massachusetts (1810-1890) in a paper read before the American Academy of Arts and Sciences on November 3, 1846. The paper was published in the *Boston Medical and Surgical Journal* of November 18 in that year. Dr. Warren was also the first American surgeon to operate for strangulated hernia.

The honor of first demonstrating to the world the art of surgical anesthesia is given to Dr. William T. G. Morton of Massachusetts (1819-1868), and in this connection should be mentioned Dr. Charles T. Jackson of Massachusetts (1805-1873) who was a rival claimant with Dr. Morton as the discoverer of the effects of ether as an anesthetic. Horace Wells of Connecticut (1815-1848) was also a claimant for notice as the discoverer of surgical anesthesia. In a dem-

onstration of the use of nitrous oxide gas for extracting teeth he failed, so it is said, to produce actual insensibility, and his failure affected him so keenly as to induce him to take his life.

The reader is referred to current journals for accounts of important developments in medicine and surgery since the beginning of the present century, and this article will close with a brief allusion to one of the most conspicuous events with which the century was ushered in, namely, the appointment of a commission to conduct researches into the "etiology, propagation and prevention of yellow fever." Of this commission Major Walter Reed, surgeon, U. S. Army, was made president, the other members being Dr. James Carroll, Dr. J. W. Lazear and Dr. Aristides Agramonte, all having the rank of Acting Surgeon in the Army.

In conclusion it may be noted that the first definite theory of the transmission of yellow fever by the mosquito was formulated by Dr. Carlos J. Finlay of Cuba, who in a paper read before the Royal Academy of Havana in August, 1881, enumerated the conditions necessary for the propagation of the fever. His paper was entitled "The Mosquito Hypothetically considered as the Agent of Transmission of Yellow Fever."

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## PAST AND PROSPECTIVE MEDICO-MILITARY FAILURE.

BY

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Some fifty odd years ago our Civil war ended with a victory for the North and the preservation of the Union. Eighteen years ago the Spanish-American war terminated with the United States a world and colonial power. Each of these conflicts saw the medical department of the army utterly discredited and distrusted by the people of the country.

There were many causes which contributed to this latter unhappy result, but unquestionably the main reason was the utter inadequacy of the number of trained medical officers in our regular service. It is a fact that pending legislation in the Senate, as recommended by the Military Committee of that body, provides even a smaller proportion of medical officers in the regular army, than were in the service at the beginning of either the Civil war or the Spanish-American war.

The lessons of the Spanish war are quite fresh in the minds of most of us and need not be repeated in detail.

However, some examples are worth recalling, for instance: In one important army corps numbering 35,000 men, more or less, there were but six trained medical officers of the army. One soon broke down from over-work, one resigned from the service, one later died from yellow fever, and practically all the administrative work fell upon the three survivors. The entire medical service of this corps fell into the hands of volunteer medical officers with no experience in the military service and necessarily

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**Cholelithiasis.—The gravest danger** from postponing operation for cholelithiasis (*American Journal of Surgery*) is the development of carcinoma of the bile tract. Empyema, gangrene and rupture of the gall-bladder are more common sequelae, to be sure, but even these late developments of cholelithiasis are usually amenable to prompt surgical treatment.

under little or no skilled supervision. The record of this particular army corps would have disgraced the Crimean war, so far as preventable disease was concerned.

In this same army corps, not only were the volunteer medical officers unskilled in military affairs, but many, principally political appointees, were not even good average practitioners of medicine. Their ideas of sanitation were *nil*, they did not appreciate, or know, even the transmission of such a well understood disease as typhoid. In one instance patients suffering from this disease were retained in a regimental infirmary on recommendation of the regimental surgeon through the political influence of the colonel of the regiment, because he, the colonel, believed that these patients would be better satisfied among their own friends than they would be if sent to a division hospital; and this in direct defiance of a general order of the commanding general directing the removal of such cases. In another instance, it was found that the regimental surgeon of a certain regiment was treating typhoid cases, retained in his regiment in disobedience of orders, by one dram doses of phenacetin at frequent intervals; the mortality can be imagined.

The above are typical examples of the medical service as rendered by a certain class of volunteer medical officers, the facts of the medical breakdown in the Spanish-American war are matters of history and record.

If we are to avoid a similar disaster in our next war we must begin now to train a personnel adequate to the tasks of war. This means that Congress must authorize a sufficient number of medical officers for the medical department of the regular army. The Surgeon General of the Army states

that the minimum is seven officers per one thousand of combatant enlisted troops.

As matters stand now, there are not enough medical officers of the army to perform the ordinary administrative and garrison duties. These scanty numbers prevent the officers of the medical corps from learning their real business, the duties of the military sanitation of troops and the evacuation of the sick and wounded in campaign. Such duties are highly complex military matters requiring complete knowledge of certain aspects of the military art in general, and much practical experience with troops in the field.

Under our present system medical officers are expected to be competent administrators and in addition universal specialists in the medical sciences, versed in the subjects of eye, ear, general surgery, internal medicine, and obstetrics.

The fact that the medical officer exists for the purposes of war is apparently lost sight of, and no opportunity is given him to perfect himself in the actual occupation for which he will be needed; garrison duties and the care of the sick including the armies' women and children are too urgent.

It must not be forgotten that our wars will be mainly fought by the National Guard and the volunteers. These forces will need training in times of peace, particularly the National Guard which actually exists in time of peace. This instruction can only be given by officers of the regular army, and if we are to have only enough medical officers of the army for garrison peace time need, where are these instructors to come from?

If an adequate personnel is not provided for the medical department in time of peace, and the inevitable breakdown of the med-

ical service in our next war results, it is imperative that we, the medical profession, see to it, that the execration which will arise, shall be directed against those who deny to us the reasonable means of fulfilling the functions of our office and profession.

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## GENERAL CONSIDERATIONS CONCERNING PERTUSSIS, WITH SPECIAL EMPHASIS ON VACCINE THERAPY—PROPHYLACTIC AND CURATIVE.

BY

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Pertussis, until recently, has been considered an acute infectious disease, with either an unknown or uncertain specific organism as a cause.

In 1900 Bordet and Gengou isolated from the pharyngeal mucus a bacillus which they considered the cause of the disease; but, though these observers with Wallstein and others showed that the organism reacted positively to agglutination tests with the blood of convalescent patients, clinicians generally refused to accept their conclusions.

It is only fair to state, I think, that the expressed doubt has been the result of the early observers' inability to produce a vaccine, or use one, that produced visible and conclusive results in the control of the disease.

It would now seem, the results of vaccine therapy, as reported by the New York City Whooping Cough Clinic, Drs. Williams and Luttinger, and quite numerous individual workers, would warrant placing pertussis in the class of diseases where a specific vac-

cine represents our chief and most efficient therapeutic agent. Also that there should no longer be any question of doubt as to the etiological role of the Bordet-Gengou bacillus in pertussis.

*Incubation Period.*—The incubation is usually between six and ten days, though cases are reported where catarrhal symptoms have developed within two days of known exposure.

*Period of Contagion.*—Repeated search for the specific organism seldom reveals its presence longer than three weeks (Williams). The catarrhal stage, the first ten days or two weeks, is the period of greatest infectivity, the contagion rapidly disappearing after the onset of the paroxysmal stage. Quarantine longer than four weeks should never be necessary.

*Susceptibility.*—Biedert, of Germany, reports an epidemic where 95.5% of 401 children under 14 years of age proved susceptible in one epidemic. Second attacks are very rarely seen, the severe spasmodic coughs are not unusual, particularly in a parent, where a child is severely afflicted.

No age may be considered immune; new-born if exposed, seldom escape, while the aged occasionally are afflicted. The great majority of cases occur between the first and fifth year, simply because they rarely escape the infection longer. The two or three months' old baby is not less susceptible; he simply is not as apt to be carried within the radius of infection, and he can not run into it.

*Mortality.*—A full majority of new-born infants exposed to pertussis, with our old methods of treatment, died. During the first and second years, the mortality is very high; after the second year, though, the mortality lessens. Pertussis has been one of the most dreaded diseases to combat.

Statistics show that over ten thousand children die each year in the United States, a greater number than from scarlet fever. Still there are few places where any quarantine is established for this scourge, all the result of indisposition on the part of the authorities to hamper the activities of the afflicted families.

*Stages of the Disease.*—The symptoms are divided into three stages, the catarrhal, spasmodic and declining.

*Catarrhal Stage.*—The catarrhal stage usually shows a slight febrile rise, and more or less rhinitis, pharangitis and bronchitis, though the bronchitis is seldom to be demonstrated clinically. Cough of a paroxysmal nature is the one constant symptom, and is almost uniformly worse at night. During this stage, which runs from seven to ten days, the demonstrable catarrhal symptoms with the fever tend to subside, but the frequency and severity of the cough increases. Pathognomonic of this stage of the disease, is to see, or hear of a child, awaking from his sleep, getting up on his knees and hands, or elbows, having his cough, and then returning to sleep.

*Spasmodic Stage.*—The spasmodic stage usually begins at the end of the first week, or some time during the second, and is indicated clinically by the "whoop." Occasionally in mild cases there will be no "whoop," simply the severe spasmodic efforts at coughing, ending with the expelling of a mass of mucus, and very frequently the contents of the stomach.

The duration of this stage averages, under our old management, well over a month, at least six weeks, and it is during this paroxysmal stage that pertussis creates the most of its havoc. Hemorrhages, cerebral and external, with resulting paralyses, blindness, deafness and mental incompetence, emphy-

sema, pneumothorax, lobar and lobular pneumonia, hernia, severe gastro-intestinal complications, convulsions, tuberculosis; this is but an incomplete, though formidable, list of the complications and sequelae of pertussis.

*Declining Stage.*—The declining stage may last any way from two or three weeks to as many months; during this stage all symptoms improve, and the patient especially is able to take and retain his food, and gets his sleep. But frequently, for a long time, a pronounced spasmodic element accompanies every coughing effort.

*Diagnosis.*—A known or possible exposure, with the development of a spasmodic cough, worse at night, particularly in the absence of adenoids, should always cause pertussis to be suspected.

The laboratory demonstration of the specific organism makes the diagnosis positive. Failure to find the organism, as in diphtheria and tuberculosis, does not make a negative statement absolute. The smear may not have been taken from mucus ejected from the larynx or LOWER, the favorite habitat of the organism. Again, other organisms may over-grow the specific ones, and render their discovery difficult.

The complement-deviation test is of little value, as it can not be obtained usually till well along in the paroxysmal stage, when the diagnosis is already positive.

Friedlander and A. E. Wagner report positive findings in two out of three cases during the catarrhal stage, and in every one of nine cases in the "first days" of the paroxysmal stage.

A decided leucocytosis is suggestive, but not conclusive evidence of pertussis; it may result from other causes.

*Treatment.*—For all time, external applications, inhalations of various kinds, and

drugs of every description, have been advised in the treatment of pertussis. During the past ten years numerous clinicians have used vaccine therapy with suspicions only of benefit. The vaccine injections have usually been from five to seven days apart, and in doses, mostly, ranging from 20 to 30 million organisms. Occasionally the dose has been increased to 50 million and less frequently still 100 million. In 1913 Luttinger reported a series of cases, beginning with 50 million and increasing to 250 million organisms.

A year and a half ago, Luttinger, and others working with him in the Board of Health Clinic also a number of attendings at various institutions and clinics, began using the vaccine practically in doses beginning with one-fourth billion, and doubling each successive dose every other day till 2 billion organisms were given with each injection; the 2 billion dose being continued every other day or three injections a week, till treatment was suspended. The above dosage was, in effect, that advised, but the total amount of vaccine used in the reported cases by Luttinger seldom exceeded 3 and a half billion and averaged about half that amount. In the quite extended use of the vaccine by the writer at St. Mary's the above doses have been maintained as regularly as attendance would admit, especially during the last two or three months.

These doses and the intervals of injections, make the earlier doses ludicrous, and at the same time stamp the vaccine in the opinion of the writer, as a distinct specific, one that lessens the severity of the disease in every way, and distinctly shortens its aggressiveness.

Any remedy which will shorten the paroxysmal stage of pertussis one week, or longer even, should be hailed as a boon, for

it is during the latter weeks, when the patient is increasingly weakened by stress, deficient nutrition and want of sleep, that the greatest possibilities of complications and sequelae arise.

In a number of cases 2 and a half and 3 billion organisms have been given in one injection to children under five years of age, with only benefit apparent. To date we have had practically no complaint of reaction, and no soreness of arm where injection was given. Two patients were attended by trained nurses and temperatures taken regularly. On neither occasion was there a particle of febrile reaction following the vaccine.

Painting the arm in the region of the deltoid insertion, with tincture of iodine, and placing the syringe in 95% alcohol after each injection, have been the antisepsis observed. The injections have all been made subcutaneously.

Our youngest patient was 22 days old, with a spasmodic cough so severe that respiration was practically suspended with each paroxysm; at the time of the first injection of one-half c. c. of vaccine he had been coughing "about one week." He received 4 and a half c. c. all told. First injection was Aug. 16th, and last Sept. 3rd, when he was practically well. Sept. 20 was reported in fine condition. The eldest patient was 26 years old, a trained nurse. After a severe cough of ten days' duration, Sept. 14th she received her first injection. Whooping began on the 17th. Received last injection, Oct. 6, nineteen days after the whoop began. Slept all night after the 28th of Sept., eleven days after the beginning of the whoop. All told received 18 c. c. of vaccine. On Sept. 25 and 28, she received 3 billion each injection and complained of feeling sick the next morning, but she "slept

"well all night" after each injection.

This patient feels without a particle of question, that the vaccine, which was her only medication, gave her the greatest possible relief, lessening the severity and frequency of the paroxysms, and particularly affording her such a sedative effect that she got a good night's sleep almost from the time of the first injection. Before the vaccine was begun she got hardly any sleep.

We have felt the earlier the patients began the use of the vaccine after beginning to cough, the more prompt was the response, and in two cases, undoubtedly exposed, and beginning to cough, the disease was abated. At least all cough ceased and there was no further trouble.

Of course regularity of injections and persistence of treatment are essentials for success. Early in our series we had much trouble from both causes. The past two months particularly, our patients mostly have reported regularly and until discharged. We interpret the present regularity of attendance to the eagerness of the mothers to benefit their children. They are not slow to note improvement, and we almost know after the 3rd, 4th or 5th injection very marked evidences of benefit will be reported.

While the disappearance of the whoop is used to indicate the end of the paroxysmal stage, be this short or lengthened, the benefits of the vaccine from seven to ten days after beginning (and this means 3 to 5 injections) are in evidence in producing marked subsidence of all symptoms—longer intervals between coughing, lessened severity, less vomiting, and last, but not least, better sleep, and better appetite.

The needle seemed to act as a deterrent in our early cases, but it is now accepted as a much easier measure than forcing medicine

down a child's throat every two or three hours, only to provoke a paroxysm and have it vomited.

*Prophylaxis.*—To date we have had the opportunity of giving vaccine to 17 patients, unquestionably exposed to pertussis but not showing symptoms, and of this number not one developed the disease.

For immunity we have endeavored to give three injections within the week, though one received but two injections and one received the first and third injection twelve days apart.

The immunity injections were one-half c. c., 1 c. c., and 2 c. c. of the vaccine, though one patient, three weeks old, received one-fourth, one-half and one c. c. of the vaccine respectively, for the three injections. I should not hesitate now giving the full immunity dose for a new-born infant.

Luttinger and others report almost absolute immunity, the result of the use of the vaccine for protection.

If the suspicion could in any way be aroused or entertained that the vaccine did not give decidedly positive results as a curative agent, as a prophylactic, there can be no dispute as to its efficiency.

I am well aware I have left myself open to criticism for not reporting any controls, but after noting the prompt effects of the vaccine upon the disease in the first cases treated, I had not the heart nor disposition to impose a fake remedy for the sake of science.

The claim also may be made that the present epidemic, from which our patients have been drawn, is a mild one, and that equally good results would have occurred if no treatment or drugs had been used. Inquiry among out mothers does not bear out this claim, for six weeks to two months of the vomiting and whooping have been almost

the rule, and many serious complications have arisen. One mother lost two children within three days with pneumonia complicated by meningitis, where no vaccine was used, while a four months' old infant in the same family promptly recovered where the vaccine was begun about the tenth day of the disease (case 44).

I should here state that all the vaccine we have used has been that made by the Bureau of Laboratories, N. Y. Board of Health. It is polyvalent, in that it contains several strains of the pertussis organism and is standardized to one billion organisms to the c. c.

In the series of cases we have treated, vaccine has been our only therapy, not one particle of medicine or advice of any description, aside from attention to diet and ventilation, has been resorted to; but we firmly believe there are a number of factors to be added to the use of the vaccine, especially among private patients with means and opportunities at their disposal, where still better results could be attained.

In this general consideration of pertussis, all we have considered effective as to treatment in the years that have passed, should still be observed.

*Fresh Air, Ventilation, Inhalations.*—When not too cold or damp, patients may properly be out of doors, but if living rooms are light and well ventilated, this is not necessary. Certainly if it is windy and dusty out of doors, the patient is better placed, if in doors.

The ideal is to have a day room and another for night. During the day, the night room is closed tightly for two or three hours, and filled with the fumes of formalin; it is then opened and ventilated. The day room is treated the same way at night. While the patient is in the room with the

windows up or down, so that the fumes are distinctly in evidence, but not too strong, the lamp is kept burning.

The formalin lamp and formalin pastiles as made by Schering and Glatz, I have used for years, and till the advent of the vaccine, I have felt it gave more benefit than all other means at my command. Over a period of ten years in private practice, where the formalin has been used, I have not had a single case of complicating pneumonia, and the severity of the symptoms and duration of the disease have been without question, lessened.

*Drugs.*—While years ago, I used a great many different drugs at different times, during the past fifteen years or more, practically but two for internal administration have been used, and these are combined; bromide of soda and antipyrene are without question the best antispasmodics we possess. This was conclusively shown by Holt and Kerley during an extensive epidemic at the New York Infant Asylum.

These drugs should be combined in a simple water menstruum, and given at two to four hour intervals. For an infant, one-half gr. of antipyrene and two grs. bromide soda is a perfectly safe dose, giving not more than six doses in the twenty-four hours. For one year, 1 gr. antipyrene and 3 grs. bromide soda. Three to four years, 2 grs. antipyrene with 5 grs. bromide soda. For older children, particularly those that can swallow a tablet, quinine sulphate, in doses of ten to fifteen grs. daily is of recognized value.

*Freshly prepared* solutions of argyrol, dropped into the nostrils, have a decided bactericidal influence on the pharynx and naso-pharynx. Where drops can be placed in the nostrils without too much excitement, I usually have 3 to 5 of a 10% solution in-

stilled into each nares about four times each day; this is done while the patient is kept on his back.

*Vomiting—Kilmer's Belt.*—Vomiting of food, is a very frequent result of the coughing paroxysm; it is not only distressing, but many times so constant that for weeks patients are practically unable to retain any food in the stomach and almost starvation results.

It goes almost without saying, if a patient vomits his food as soon as taken, he should at once be persuaded to take some more. It

is a good rule to try and feed a patient as soon as possible after a paroxysm, hoping he may have an interval of a half hour or more in which to absorb a portion. Milk, cereal gruels, sugar, and raw or slightly cooked eggs, should be our main dietary where vomiting is a pronounced factor.

Kilmer's belt, when properly adjusted, has been very frequently a means of enabling the patient to keep his food. Older patients, even when not vomiting, experience a degree of comfort from the belt that is gratifying.

TABLE No. I.  
PROPHYLACTIC CASES.

Serial No.	Age.	Exposure.	Symptoms.	No. Injections.	Total vaccine, 1 billion or ganisms = 1 c. c.	Remarks.
1	6 mos.	In clinic.	Cough at night.	3	1 $\frac{3}{4}$ c. c.	Had no whoop—no vomit.
2	3 yrs.	In clinic.	Paroxysmal at night—3 or 4 days.	3	3 $\frac{1}{2}$ c. c.	Had no whoop—no vomit.
3	14 mos.	To sister.	None.	3	2 $\frac{1}{4}$ c. c.	No symptoms month later.
4	2 yrs.	Child in family.	None.	3	4 $\frac{1}{2}$ c. c.	No symptoms month later.
5	6 wks.	Neighbors.	None.	3	3 $\frac{1}{2}$ c. c.	Well 1 month later.
6	2 $\frac{1}{2}$ yrs.	In family.	None.	3	3 $\frac{1}{2}$ c. c.	Month later, had slight cough for 2 weeks—no whoop.
7	2 yrs.	Sister.	None.	3	3 $\frac{1}{2}$ c. c.	No symptoms.
8	5 yrs.	Sister.	None.	3	3 c. c.	No symptoms.
9	3 wks.	3 other children.	None.	3	1 $\frac{3}{4}$ c. c.	No symptoms after 3 weeks.
10	3 yrs.	In family.	Cough for 1 wk.	3	3 $\frac{1}{2}$ c. c.	No cough, 1 week after beginning vaccine.
11	10 yrs.	In family.	None.	2	1 $\frac{1}{2}$ c. c.	No symptoms.
12	1 yr.	Sister.	Cough increasing for 1 wk.	4	4 $\frac{1}{2}$ c. c.	Slept all night week after beginning vaccine. Slight cough in day time.
13	7 yrs.	2 other children.	Coughing 1 day.	3	3 $\frac{1}{2}$ c. c.	No cough after 1 week.
14	2 mos.	Brother.	None.	3	3 $\frac{1}{2}$ c. c.	Slight cough 2 weeks later—no whoop—no vomit.
15	—	2 sisters, one 2 wks., other just beginning.	None.	3	3 $\frac{1}{2}$ c. c.	No cough, 10 days after the first injection.
16	6 yrs.	Sister of 15	None.	3	3 $\frac{1}{2}$ c. c.	No cough 10 days after the first injection.
17	17 days.	In home when 1 wk. old.	None.	3	3 c. c.	Well when 26 days old.

TABLE No. II.  
PERTUSSIS CASES TREATED WITH VACCINE.

Serial No.	Age.	Duration of cough before vaccine.	Date of first vaccine.	Date of last vaccine.	Duration of whoop.	No. Injections.	Total vaccine in c. c.	Remarks.
1	4 yrs.	17 days.	Aug. 12.	Sept. 16.	26 days.	10	15 c. c.	Large tonsils—adenoids.
2	1 yr.	21 days.	Aug. 12.	Sept. 15.	45 days.	10	8½ c. c.	Only 2 injections, the last exceeded 1 c. c. Cough practically stopped Aug. 30, no whoop Aug. 25. Began again Sept. 15 and lasted 3 days.
3	14 mos.	28 days.	Aug. 12.	Aug. 27.	35 days.	5	4½ c. c.	.....
4	22 days.	7 days.	Aug. 16.	Sept. 3.	Got black, no whoop, whole disease 25 days.	5	4½ c. c.	After 3 injections practically well. Condition desperate at first.
5	9 mos.	21 days.	Aug. 18.	Sept. 1.	12 days.	6	4 c. c.	.....
6	9 yrs.	14 days.	Aug. 30.	Sept. 27.	Not noted.	7	9 c. c.	Most marked benefit after the 3rd injection. Slept all night.
7	20 mos.	21 days.	Aug. 23.	Sept. 20.	21 days.	6	6½ c. c.	.....
8	2 yrs.	14 days.	Aug. 24.	Aug. 30.	30 days.	3	2½ c. c.	After the 3rd injection cough was very much less severe and did not return for vaccine.
9	2½ yrs.	10 days.	Aug. 25.	Sept. 4.	10 days.	5	5 c. c.	.....
10	3 yrs.	4 to 6 days.	Aug. 27.	Sept. 20.	21 days.	8	8 c. c.	Child practically well Sept. 13th.
11	4 yrs.	4 days.	Aug. 27.	Sept. 13.	17 days.	6	7 c. c.	.....
12	2 yrs.	7 days.	Aug. 30.	Sept. 10.	36 days.	3	2½ c. c.	2nd and 3rd injections 8 days apart.
13	18 mos.	7 days.	Sept. 13.	Sept. 20.	14 days.	4	4 c. c.	Another child has pertussis.
14	4 yrs.	14 days.	Sept. 13.	Sept. 22.	15 days.	4	3½ c. c.	Typical cough in clinic.
15	26 yrs.	10 days.	Sept. 14.	Oct. 6.	21 days.	8	18 c. c.	Trained nurse—5 days after beginning vaccine very marked benefit—after 3rd injection practically slept all of each night. 2 injections of 3 c. c. each time made her feel "sick" next A. M., though she slept all night.
16	2 yrs.	17 days.	Oct. 4.	Oct. 28.	24 days +.	9	18 c. c.	Gave wrong address and could not be found; very large tonsils.
17	4½ yrs.	21 days.	Sept. 27.	Oct. 7.	24 days.	5	9½ c. c.	Well 10 days after first vaccine.
18	5½ mos.	21 days.	Sept. 27.	Oct. 4.	27 days.	4	4½ c. c.	After Oct. 4 cough infrequent and not severe.—Before Sept. 27, very severe.
19	4 yrs.	2 mos.	Sept. 27.	Oct. 29.	90 days +.	6	11½ c. c.	Oct. 13 there was no whoop and little cough; vaccine stopped—whoop recurred Oct. 29 and patient disappeared.
20	3 yrs.	42 days.	Oct. 1.	Oct. 11.	40 days.	4	7¾ c. c.	Improvement was very marked from first injection.

TABLE No. II—Continued.

Serial No.	Age.	Duration of cough before vaccine.	Date of first vaccine.	Date of last vaccine.	Duration of whoop.	No. Injections.	Total vaccine in c. c.	Remarks.
21	9 mos.	42 days.	Oct. 1.	Oct. 11.	40 days.	4	6 c. c.	20 and 21 sisters.—Improvement very marked after getting first injection.
22	7 mos.	Not stated.	Oct. 6.	Oct. 29.	?	7	6½ c. c.	Still whooping Dec. 9th. In bad condition.—Injections were all small.—Average less than 1 c. c.
23	2 yrs.	30 days.	Oct. 7.	Oct. 18.	15 days.	4	2½ c. c.	Whooped first Oct. 3rd, and last, Oct. 18th.
24	4 mos.	21 days.	Oct. 8.	Oct. 29.	None.	8	8¼ c. c.	Oct. 20 had lobular pneumonia which continued to extend.—Child died Nov. 15.—Was not seen after Nov. 1st.—Two other children had pertussis.
25	14 mos.	14 days.	Oct. 19.	Oct. 29.	60 days.	4	2¼ c. c.	Still whooping infrequently Dec. 9th.—Received small doses vaccine and few of them.
26	1 yr.	1 day.	Oct. 20.	Nov. 8.	?	5	8 c. c.	Died of pneumonia in hospital Nov. 9th.
27	3 yrs.	5 days.	Oct. 25.	Nov. 22.	22 days.	7	8½ c. c.	Very little cough after Nov. 8th, 4th injection—seldom whooped.
28	7 yrs.	10 days.	Oct. 30.	Nov. 26.	27 days.	7	13½ c. c.	Very little cough after Nov. 8th, 4th injection.—Seldom whooped.
29	18 mos.	14 days +. Nov. 1.		Nov. 26.	51 days +.	6	9 c. c.	Had pneumonia Nov. 8-17. Had vaccine Nov. 3, 8, 17, 22, 26.—Still whooping Dec. 21.
30	6½ yrs.	10 days.	Nov. 21.	Dec. 20.	29 days.	7	12½ c. c.	In hospital with pneumonia 3 weeks.—Sent home Nov. 20 with whoop present.
31	3 yrs.	12 days.	Nov. 3.	Nov. 15.	10 days.	5	7½ c. c.	No whoop after Nov. 8th.—3rd injection.
32	5 yrs.	10 days.	Nov. 14.	Nov. 19.	9 days.	3	3½ c. c.	Very marked results followed the 2nd injection.—After the 3rd, slept all night.
33	16 mos.	30 days.	Nov. 15.	Nov. 24.	27 days.	4	5 c. c.	Patient supposed to have had pertussis in July—also spinal meningitis.
34	9 yrs.	14 days.	Nov. 17.	Nov. 24.	12 days.	3	3½ c. c.	Brother of case No. 33.
35	6 yrs.	8 days.	Nov. 18.	Nov. 30.	?	6	9 c. c.	Removed to Bellevue, Dec. 5th, because of "trouble at home." Still whooped infrequently. Was very much better after Nov. 26—5th injection.
36	3½ yrs.	10 days.	Nov. 23.	Dec. 7.	18 days.	8	13 c. c.	A cerebral palsy patient in whom a cerebral compression operation was performed. Began to whoop 4 days after his operation.—Made a fair recovery. Brother had pertussis.

TABLE No. II—Continued.

Serial No.	Age.	Duration of cough before vaccine.	Date of first vaccine.	Date of last vaccine.	Duration of whoop.	No. Injections.	Total vaccine in c. c.	Remarks.
37	19 mos.	14 days.	Dec. 14.	Jan. 14.	32 days.	8	13½ c. c.	Whoop had stopped Jan. 5th but recurred Jan. 14th. There had been no vaccine between these dates.
38	7½ yrs.	7 days.	Dec. 1.	Jan. 3.	30 days.	7	13½ c. c.	.....
39	5 yrs.	21 days.	Dec. 10.	Dec. 29.	29 days.	8	17 c. c.	Between Dec. 15 and 22 no whoop and no vomit. Relapsed Dec. 24 and ceased Dec. 29th.
40	3½ yrs.	7 days.	Dec. 1.	Jan. 5.	37 days.	9	20 c. c.	Patient did not report between Dec. 10 and 20, also between 20 and 27. Received 3 c. c. Dec. 20, 27, 31 and Jan. 3 with marked evidences of improvement.
41	6 yrs.	7 days.	Dec. 3.	Dec. 27.	No whoop.	5	7½ c. c.	Brother of No. 40.
42	2½ yrs.	14 days.	Dec. 20.	Dec. 31.	One whoop, only 1 day.	5	7½ c. c.	.....
43	9 mos.	3 days.	Dec. 22.	Dec. 31.	5 days.	5	7½ c. c.	.....
44	4 mos.	10 days.	Dec. 15.	Dec. 31.	9 days.	7	9¾ c. c.	Two sisters died of disease complicated with pneumonia and meningitis.
45	6 wks.	14 days.	Jan. 3.	Jan. 14.	12 days.	6	9 c. c.	Very marked benefit after the first injection.—After the 3rd, infrequent paroxysms and slight inseverity. No whoop, cough or vomiting after Jan. 15.
46	8 mos.	12 days.	Oct. 7.	Oct. 18.	18 days.	4	3½ c. c.	.....
47	5 yrs.	30 days.	Oct. 7.	Oct. 18.	38 days.	5	3½ c. c.	Small doses vaccine given late in disease.
48	3 yrs.	21 days.	Dec. 13.	Dec. 20.	17 days.	4	6 c. c.	.....
49	3 mos.	7 days.	Dec. 10.	Dec. 29.	10 days.	8	12½ c. c.	Whoop stopped after 3rd injection. While symptoms were very severe Dec. 15, after Dec. 20, 4th injection, no vomit, infrequent and mild cough.
50	3 yrs.	8 days.	Jan. 4.	Jan. 17.	13 days.	7	13 c. c.	After 4th injection marked subsidence of all symptoms, 5th and 6th injections, 3 c. c. each, with only benefit reported.
51	4½ yrs.	7 days.	Dec. 27.	Jan. 15.	20 days.	8	13¼ c. c.	Reported by kindness of Dr. Schlegmann. Temperature taken every day and showed no variation from normal after beginning vaccine.
52	3 yrs.	21 days.	Jan. 14.	Jan. 24.	24 days.	4	7 c. c.	Never vomited food.
53	5 yrs.	14 days.	Jan. 11.	Jan. 24.	17 days.	7	12 c. c.	.....

Selecting from Table 2 those cases, coughing 14 days or less, 28 cases we find the average duration of the whoop was  $19\frac{1}{3}$  days. Excluding Nos. 8, 12, 25 and 37 for obvious reasons, irregular attendance, and small amounts of vaccine received, gives an average of 16 days for the paroxysmal stage of the remaining 24 cases.

cine, the whoop continuing from 50 to 150 days.

*Conclusions.*—Vaccine seems effective in any stage of the disease, and should be given, though the patient is well advanced in the paroxysmal stage.

As a prophylactic, in our experience, it has been absolute, and every endeavor should be used to induce those who have

TABLE No. III.  
PERTUSSIS CASES RECEIVING LITTLE OR NO VACCINE.  
*Showing Length of Disease.*

Serial No.	Age.	Disease began.	Whoop ended.	Total vaccine.	Duration of whoop.	Remarks.
1	5 yrs.	July 19.	Still whooping Oct. 25.	Aug. 27—1 c. c. Oct. 22—1½ c. c. Oct. 25—2 c. c.	87 days.	Whole trouble stopped soon after Oct. 25.
2	3 yrs.	Aug. 6.	Oct. 25.	Aug. 27—¾ c. c. Oct. 22—1 c. c. Oct. 25—2 c. c.	70 days.	Marked improvement followed the late injections.
3	7 yrs.	Aug. 6.	Oct. 25, still whoops.	Aug. 27—1 c. c. Oct. 22—1½ c. c. Oct. 25—2 c. c.	70 days and still whoops.	Sister of No. 2.
4	2½ yrs.	Aug. 17.	Jan. 19, still whoops and vomiting.	None.	145 days and still whoops and vomits.	Got no treatment.
5	5 yrs.	Sept. 17.	Nov. 30.	Sept. 24—½ c. c. Sept. 27—1 c. c. Sept. 29—1½ c. c.	65 days.	Brother of No. 4.
6	8 yrs.	Oct. 28.	Jan. 10.	Nov. 8—½ c. c. Nov. 10—1 c. c.	63 days.	Had pneumonia Dec. 9.
7	5 yrs.	Nov. 5.	Jan. 1.	Nov. 8—½ c. c. Nov. 10—1 c. c.	50 days.	Sister of No. 6.

The remainder of the 52 cases had been coughing and whooping anywhere up to two months, and should not be considered in forming an estimate of the value of any remedy as influencing the paroxysmal stage.

Observing these cases though from day to day and noting the reports of the attendants, could not but impress one with the value of the vaccine.

Table No. 3 is appended to show the course of the disease with little or no vac-

been exposed, or who have possibilities of exposure about them, to take advantage of the vaccine.

The formalin lamp should be used whenever practical.

Bromide of soda with antipyrene, where a child will take it without excitement, should be given at 4, 7 and 10 P. M. to insure better sleep.

The use of argyrol should be considered. Kilmer's belt, where vomiting is pro-

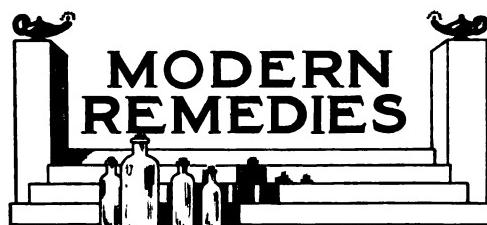
nounced, should always be given a trial. It is many times comforting, where there is no vomiting.

Good ventilation, and every endeavor to influence nutrition, are of greatest value.

Recognition of the valuable assistance of Drs. Frank A. King and Elihu Katz, in caring for our patients, should here be expressed.

To Miss Sutton and Miss Kunz great appreciation is due for our listing files, and segregation of our patients, while to Miss Work, our clinic nurse, we ascribe much of the regularity of attendance of our patients and our ability to give final and definite reports.

Through her zealousness, while visiting, we have had the opportunity of treating many more patients than would otherwise have come to us.



Conducted under the Editorial Direction of  
Dr. John W. Wainwright.

**Fuchsin in Impetigo.**—Ferreira reports in the *Semana Medica*, September 2, 1915, twelve cases of the rapid curative action of fuchsin in skin disorders in infants, including intractable impetigo; gluteal erythema and intertrigo. It was of service in cases when there was an underlying state of malnutrition in artificially fed infants.

**A New Paste for Skin Affections.**—Unna, (*Berliner Klin. Wochenschrift*, June 28, 1915), uses and recommends a substitute for starch as a dusting powder in the treatment of eczema, sunburn, and other skin disorders, cooling pastes containing calcium or magnesium carbonate. By mixing 30 c. c. each of linseed oil and lime water and then incorporating about 20 grams each of zinc oxide and calcium carbonate a satisfactory paste will result. This combines the cooling and drying properties of starch with the action of a dilute alkali which has proved useful in eczema, burns, erysipelatoid affections and other marked inflammations of the skin. In cases with foul secretions the paste may be made anti-septic by using calcium chloride instead of the carbonate. If pastes other than the above are desired, the following mixtures will be found preferable to starch: Terra silicea five grams, zinc oxide twenty-five grams, oil of arachis (peanut oil) ten grams and lard sixty grams; or one may reduce the zinc oxide in the above to fifteen grams and adding ten grams of precipitated sulphur. These are both hygroscopic.

**Optochin and Camphor in the Treatment of Pneumonia.**—Rosenthal, (*Ber-*

**Alkaline carbonates** (*Med. Council*) are not desirable in the treatment of rheumatism, the acetates and citrates being better because, when absorbed, they act as antacids. Potassium salts act better than do those of sodium. Carbonates are neutralized by the gastric juice.

**A Suggestion for Giving Castor Oil.**—The disagreeable taste of castor oil, say *The Nurse*, may be concealed by giving the dose in hot milk flavored with salt and a sprinkle of black pepper. It is necessary to have the milk warm enough to mix with the oil or some of it will float on the surface. A patient who objects to castor oil may take it in this way and not realize what he is drinking. Castor oil can also be made more palatable by adding lemon juice. The former method is probably more palatable for a patient who can take milk. The taste of Epsom salt, which is also nauseous to many, can be disguised by the use of lemon juice.

*liner Klin. Wochenschrift*, June 28, 1915), declares that mice infected with one of the many strains of pneumococci and treated prophylactically, or after infection had developed with camphor, optochin, or the two combined. The conclusion was reached that many strains of pneumococci were not influenced by the camphor. Others originally susceptible soon acquired a lasting resistance. Optochin alone gave fairly satisfactory results, but when combined with camphor its effectiveness was greatly reduced and toxic symptoms were prone to develop, which often resulted fatally. In view of the common occurrence of strains of pneumococci resistant to camphor, the utility in the specific treatment of pneumonia should be regarded as slight. Also, in view of the toxic action of a combination of optochin and camphor, the camphor should not be used as a cardiac stimulant in patients under treatment with optochin.

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**Roentgen Rays for Venereal Bubo.**—Kall, (*Münchener Medizin Wochenschrift*, October 19, 1915), declares the Roentgen rays will bring about resorption and cure of venereal bubos in the vast majority of cases if used before suppuration exists. He uses one-sixth the thickness of the ordinary aluminum filter for deep ray therapy, that is one-half millimeter and half the focal skin distance. After one application of 10X. the bubo will be very much smaller while pain will have disappeared. After two to four such treatments complete absorption takes place. This may come about after fluctuation has supervened. When there is abscess formation, Kall advises a small incision to be followed by the Roentgen rays which he declares will hasten convalescence.

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**Urea, a Bactericide in the Treatment of Wounds.**—Symmers, (*London Lancet*, December 4, 1915), writes that he discovered some years ago that urea destroyed microorganisms in culture media. That when added to albuminous material such as tuberculous sputum it inhibits the growth of practically all microorganisms. It is also a bactericide when in the presence of blood. Symmers therefore recommends urea in the treatment of wounds. It is nontoxic as has been

shown through its being sprinkled pure on Thiersch skin grafts, or when one and a half drams in powder was placed between the fragments of a fracture which had been plated and the wound closed.

Excellent results have been obtained during the present war in Europe by the use of urea as a disinfectant for wounds, the one and only objection being that its application causes some pain. It is used as a dusting powder. Processes of repair are not delayed.

#### **Magnesium Sulphate in Nonamebic Dysentery.**—F. Wyatt-Smith (*British Medical Journal*, November 27, 1915), directs attention to an account of his experience with magnesium sulphate in this form of dysentery during a campaign in India.

His experience has been confirmed by reports from the front in the present European War, as well as from the South African War. While this treatment was known three hundred years ago, this fact need not discourage our young men of today, for they will be gratified with the results from this treatment in the nonamebic dysentery.

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#### **The Allen Treatment of Diabetes.**—

Friedenwald and Leinbaugh, in the *Inter-state Medical Journal* for January, 1916, discuss twenty cases of diabetes treated by the Allen starvation plan, all of which were rendered sugar free in from one to four days. The diet they declare should be gradually increased following the starvation days, and fats and proteids as carefully regulated as are the carbohydrates.

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#### **Vaccines in Treatment of Arthritis.**—

Seaborn (*Canadian Practitioner*) writes that it is now well recognized that the focus of chronic suppuration must be removed, whether it be the tonsils, teeth, nasal fossa, appendix, or prostate. He declares that in many cases, after most careful search, when the serum in the joint is negative, the offending organism may be located in the lymphatic gland nearest to the disturbance and a vaccine made from a culture.

Conducted under the Editorial Direction of Dr. Henry R. Harrower.

**The Local Use of Adrenal Solution on Wounds.**—A 1:100,000 solution of suprarenin, a German preparation of the active principle of the adrenal medulla, has been in use as a local application to granulating wounds for nearly five years by Wildt, who recently (*Münch. Med. Wochenschr.*, Nov. 23, 1915) recommends it. It is without ill effects, favors healing and keeps the granulations soft and velvety. In 421 army cases in 1915, Wildt finds this solution superior to such local treatment as scharlach-rodt, the ultra-violet rays or hot air; and from the measures with which Wildt is comparing this solution it would appear that many of the wounds thus treated were of the chronic, indolent variety.

**Combining Organotherapeutic Extracts.**—A considerable and increasing interest is now being manifested in the administration of mixed glandular extracts or pluriglandular therapy, as it has been called, and, as usual, the skeptics condemn it without trial and their comment is crystallized into a statement recently heard following a medical gathering: "It is nothing more nor less than a reversion to the old-fashioned shot gun mixtures of our grandfathers."

Now nothing could be further from the truth, for while it is admitted that pluriglandular therapy involves the use of several preparations simultaneously, it is not in the least degree similar to "shot-gun" medication, for those who express their skepticism overlook the fact that the blood plasma contains an extremely complex mixture of substances, including the numerous hormones from the glands of internal secretion. The blood is the common highway for all these chemical messengers as well as the scores of other specialized proteins con-

cerned in the production of immunity. While this is in mind it may be recalled that not many years ago "mixed vaccines" were condemned as unscientific and the same epithet—"shot-gun mixtures"—was applied to them; yet today in the highest circles here and abroad "tetravaccines" and "pentavaccines"—nothing if not combinations of four or five different organisms, given with the expectation of producing simultaneously four or five sets of immunizing substances in the blood—are recommended as rational and effective and their application has been tested in hundreds of thousands of cases!

To return to our subject. If it were possible to separate from a quantity of blood serum all the hormones in solution, we would find them in proportions suited to the functional condition of the individual, and in harmony with one another. The organs influenced by them have the faculty of picking them up from the plasma and being stimulated or otherwise as their need may be.

If, then, there is a deficiency in one or more of these substances, there follows a pluriglandular dyscrasia—never a monoglandular disorder, which obviously means that pluriglandular therapy is more definitely indicated than is the administration of a single glandular extract.

From a clinical standpoint there is plenty of proof that this "shot-gun hormone therapy" is effective and, too, that it is more effective than the use of single extracts. In fact failures with the application of organotherapy, even in the best known disorders where one extract is usually given as thyroid in myxedema, pituitary in Froehlich's syndrome or corpus luteum in climacteric disorders, are often due to the fact that more than one gland is involved. Many times cretins advance much more rapidly

when to their necessary modicum of thyroid is added some other deficient, synergistic extract. Quite recently Blair Bell (*Practitioner*, Feb. 1915, p. 270) illustrated this very nicely in the following statement:

"Ovarian insufficiency we can ignore from a diagnostic point of view; and this is convenient as it is most difficult to demonstrate. Such a proceeding is scientifically justified by the knowledge that both thyroid and pituitary insufficiency induce ovarian insufficiency. When we have decided whether it be the thyroid or pituitary which is at fault, we should treat the case by the administration of pituitary substance (whole gland gr. v, *ter diem*) or thyroid extract (dried gland, gr. i or more every night) as the case may be, together with ovarian extract<sup>1</sup> (gr. x, *ter diem*). It is, further, my opinion that ovarian extract is of little use when given alone, but that good results may be expected when it is combined with thyroid or pituitary extract, according to which is required."

Many other quotations might be made and evidence adduced to show that combining organo-therapeutic extracts is both scientific and useful. Surely this derided "shot-gun hormone therapy" is much more reasonable than the old-fashioned "black draught" which is the typical example of the poly-pharmacy of our grandfathers; and the results which follow its application—as well as those which are not obtained when pluriglandular therapy is overlooked or ignored—are encouraging and convincing, for this is a natural method of treatment and the combination of the various stimuli administered by us favor the production of increased quantities of the internal secretory

principles which, as has been previously explained (see *AMER. MED.*, Aug. 1915, p. 639), obviously must be reduced when the other activities of the body are so generally below par.

#### **Pancreatin in Exophthalmic Goiter.—**

In a note by Leviton in the *Journal A. M. A.* (Jan. 1, 1916, p. 50) reference is made to some clinical experiences which show the intimacy of the relation between the ductless glands and the unexpected clinical results that sometimes are noticed during the treatment of disorders of the internal secretory organs.

Leviton gave 15 to 20 grains of pancreatin by rectal administration two or three times a day to a series of cases of diabetes mellitus. In two or these there was a complete cessation of the manifestations of an exophthalmic goiter which was associated with the diabetes. Experiences of this character, while not necessarily advancing new and unquestioned methods of treatment, are convincing evidence of the importance of the hormone balance and its disturbances, and indicate that pancreatic disease may complicate thyroid disease and *vice versa*, and that therapeutic advantage may be taken of these possibilities.

#### **Adrenal Substance in Cardiac Asthenia.**

—Too often the cardiac-tonic effects of total adrenal gland substance is passed over. We have become so accustomed to the use of the extremely potent active principle and have used it *in extremis* that we forget that the less active and slower acting influence of the principles in the dried gland are valuable and deserve to be administered more frequently.

In a recent consideration of the drug therapy of cardio-vascular diseases, Satterthwaite (*International Clinics*, 1916, vol. 1, p. 26) has a good word for the Armour preparation of desiccated total adrenal gland. He recommends it as a useful vaso-motor tonic. The U. S. P. dosage is given as 4 grains, while Satterthwaite uses  $2\frac{1}{2}$  grains three times a day. Single doses as a rule will relieve palpitation in a comparatively short time. Occasionally this remedy has been given in heart weakness

<sup>1</sup> Blair Bell does not believe that there is the great advantage in corpus luteum over total ovarian substance that has been claimed. He says in the article from which we have quoted above "I believe that luteal extract possesses no advantage over whole-ovary extract; indeed, I prefer the latter on scientific grounds." In another communication (*Proc. Royal Soc. Med.*, Nov. 6, 1913, Sec. Obs. & Gyn., p. 67) Blair Bell says. "There is at present no scientific foundation for the employment of extracts made from parts of the ovary which do not contain interstitial cells, except, perhaps, in the attempt to treat repeated abortion by extract of the corpus luteum. I believe that the treatment of meno-pausal disturbances lies in the suitable use of the extracts of endocrinous glands other than the ovary, alone or in conjunction with ovarian extract."

in amounts up to  $12\frac{1}{2}$  grains per day, maintaining this dosage for a couple of weeks at a time.

Satterthwaite remarks that he is not favorable to the use of adrenalin in such cases, although, of course, its pronounced vaso-constrictor action may be beneficial by causing an increased blood pressure and its digitalis-like action upon the heart muscle itself, slows and steadies its action. Unfortunately it has certain depressing by-effects, especially upon the respiratory center, and Wilcox insists that adrenalin should be used in cardiac disease with extreme caution.

The dry total extract exerts a slower but more lasting effect in cases where cardiac asthenia is a part of the symptom complex, and Satterthwaite's recommendation to give  $2\frac{1}{2}$  or more grains three or four times a day, with or without other medication, is well worth following more often.

#### **Neurasthenia and the Thyroid Gland.—**

Chas. Reeder (*Illinois Med. Jour.*, Oct., 1915) has noticed during ten years of careful observation that whenever he finds individuals with mental depression, insomnia, faulty assimilation and intestinal indigestion with painful nervous headaches or other symptoms which are usually classed as "neurasthenia," a close examination would indicate some abnormal condition of the thyroid in at least 50 per cent. of these cases. He believes that the early discovery of this condition and its prompt treatment would prove of great value. In all cases of pronounced "neurasthenia" it is urged that the common symptoms of hypothyroidism be sought for, and when found and treated with carefully regulated thyroid therapy, it will be surprising how much better results are obtained in this perplexing class of cases.

#### **PRACTICAL POINTERS.**

**In insomnia** pituitary preparations have occasionally given good results.

**Migraine** is often present in individuals with a well-marked hypothyroidism. In such cases the headaches have been quite remarkably controlled by thyroid therapy.

**In bronchial asthma** two minims of the standard 1:1,000 solution of adrenalin hypodermically often suffices to give instant relief. We have been using too large doses.

**Anterior Pituitary in Epilepsy.**—Desiccated anterior pituitary gland,  $2\frac{1}{2}$  grains three times a day, increasing to twice this amount, has been recommended in epilepsy. Lindenberger, *Pediatrics*, Jan., 1916, p. 4.

**Augmenting the Action of Thyroid.—**  
Iodine, arsenic, sulphur and phosphorus are said to influence the activity of the thyroid secretion and properly may be used to reinforce the action of the dry extract.—*Clow.*

**Thyroid in Lumbago.**—In chronic lumbago when other usual remedies have failed thyroid therapy has been successfully tried. It must be given in fairly large doses, 2 or more grains three or four times a day, for some weeks.

**Morphine and Pituitary** seem to be physiological antagonists. Pituitrin is useful in the adjunct treatment of drug addicts and morphine will overcome the undue contractility of the uterus following the injection of pituitrin.

**A Postoperative Tonic.**—Pituitary solutions hypodermically or the desiccated powder by mouth, are both excellent general tonics following operations. Combined with saline infusions it may be particularly useful following chloroform anesthesia.—*Jaschke.*

**Dyshormonism in Soldiers.**—Thyroid, pituitary or adrenal preparations have been used by Kohnstamm to improve morbid conditions resulting from emotional strain in soldiers in active service. The remedy is selected by studying the class of symptoms. Sometimes a pluriglandular mixture is given.

**Air Space and Ventilation.**—In sanitary regulations much stress has lately been placed upon the cubic air space as an index of the safety of dwellings, institutions, hospitals, wards and similar places where large numbers of persons are housed or congregate. The public health law of New York State provides that "in every dormitory 600 cubic feet of air



space shall be provided and allowed for each bed or occupant, and no more beds or occupants shall be permitted than are thus provided for, unless free and adequate means of ventilation exist approved by the local board of health, and a special permit in writing therefor be granted by such board."

The New York State Board of Charities establishes a minimum of 600 cubic feet for children under 12 years and 800 cubic feet for persons more than 12 years.

In Louisiana, the Sanitary Code provides among other things that there shall be 300 cubic feet per hour for each occupant, and rooms or halls where over 150 persons congregate must be provided with an exhaust fan for the removal of the lung exhalations and respired carbon dioxid of the occupants.

California's penal code calls for 500 cubic feet of space per person in all buildings or structures utilized for the purpose of lodging or sleeping apartments.

Michigan provides 1,000 cubic feet of air space for all institutions where adults are housed and 500 cubic feet for all institutions where children are housed.

In general practice, school buildings are usually designed so as to possess ventilating plants yielding at least 1,800 cubic feet of air per pupil per hour. The highest standards provide 3,000 cubic feet per pupil per hour.

It is a serious question whether too much

stress has not been placed upon cubic air space in establishing sanitary standards. If there were static air volume, it would obviously be necessary to have a different standard than is necessary when there is a dynamic air volume. Natural ventilation can only be inhibited in an air tight structure. As long as there are doors and windows, some air motion and resultant change of air must occur. With artificial ventilating plants, it is patent that the air volume is no longer static.

From the standpoint of sanitation, the air which is of ventilation value to the individual person is the stratum of air immediately surrounding the body or the volume of air immediately in front of the nose or mouth. Frequently, individuals attack the question of cubic air space with a view to relieving institutional congestion. The problem of floor space is immediately concerned in the question of room congestion and along with it is bound the question of comfort, fire, safety, and danger of infection. The establishment, however, of air space requirements, unless it involves a floor area requirement, fails to approach this specific problem.

Hess (*Archives of Pediatrics*, February, 1916) calls attention to the recent organization of the Hebrew Infant Asylum into large wards containing 20 to 25 infants and a cubicle system providing for an equal number of infants. He states "the cubic space is about 450 feet per baby in all three wards, and yet the results in the cubicles far exceed those attained in the wards, demonstrating that the number of cubic feet is only one of many factors which enter into the welfare of the infants."

Temporarily forgetting our traditions, one may readily appreciate that the diver in his diving suit has a minimal air space but ventilation is maintained by the constant

pumping in of oxygen and the removal of the excretory products of respiration. This fact is also forcibly indicated by the meagre cubic capacity of baby incubators utilized for nurturing premature infants. The average cubic capacity is only about  $4\frac{1}{6}$  cubic feet, but nevertheless the air is maintained in the hygienic state necessary for the welfare of the infants by thorough ventilation.

Hornsby and Schmidt, in their splendid work, *The Modern Hospital*, make the following statement: "The minimum area and cubic contents per bed permitted in Chicago at the close of 1912 are 80 square feet and 800 cubic feet. No distinction is made between adults, children, or infants. Such factors are probably based on usage which appears to have been safe, or they were selected to accommodate and not disturb existing institutions."

They refer to a law to be introduced in the State of Illinois which establishes standards for both floor space and cubic air space which are as follows:

**MINIMUM SQUARE FEET OF FLOOR SPACE PER PERSON.**

	Adults	Children	Babies
Private rooms...	90	75	55
Wards .....	80	65	45

**MINIMUM CUBIC FEET OF AIR SPACE PER PERSON.**

	Adults	Children	Babies
Private rooms...	900	675	500
Wards .....	800	600	400

The new regulations of the Industrial Commission of Ohio make the following provisions:

**THE FOLLOWING NUMBER OF CUBIC FEET OF AIR TO BE SUPPLIED FOR EACH PERSON PER HOUR—ASYLUMS, HOSPITALS AND HOMES.**

**Rooms with fixed capacity.**

	Adults	Children	Babies
Hospital, contagious and epidemic .....	6,000	4,000	3,000
Hospitals, surgical and medical .....	3,000	2,400	1,500
Penal institutions.....	1,800	1,800	.....
All other buildings.....	1,800	1,500	.....

**THE MINIMUM CUBIC FEET OF AIR SPACE IS PLACED AT THE FOLLOWING STANDARDS.**

Kind of occupancy	Adults	Children	Babies
Private rooms, hospital..	900	675	500
Dormitories, hospitals ..	820	600	400
Cells, penal institutions.	400	400	...

Private rooms, other buildings .....	700	540	300
Dormitories, other buildings .....	550	325	225

It is apparent that a careful attempt is being made to establish rational standards for the hygienic ventilation of institutions. It is equally manifest that cubic air space as a single factor is an insufficient criterion of general healthful conditions. In order to establish fair regulations, cubic air space per capita should be considered in relation to the number of cubic feet of fresh air per capita delivered hourly. Even such regulations without standardizing temperature and humidity would not satisfy all the hygienic requirements to safeguard institutional life, particularly for infants and children. Considered as a unit measurement, 600 cubic feet of air space per child is probably adequate for infants and children under ordinary circumstances, particularly if 40 to 80 square feet of floor space be established as the minimum per capita for infants and children.

When, however, the question of preventing contagion in hospitals is taken into consideration, it is more important to increase the requirements of floor space in order to lessen the possibility of contact infection or infection by organisms discharged from the nose, throat, or lungs. Under such conditions, the air cannot be permitted to be static in character and regulations should establish the minimum number of cubic feet of air to be supplied for each person per hour, together with standards for temperature and humidity.

Those who are familiar with gymnasiums possessing a large cubic capacity, but with the windows at the top of the building and with an inadequate system of ventilation, are acquainted with the dead stale odor characteristic of that portion of the air in which the occupants of the gymnasium disport themselves. Because of the inadequate ventilation, the air in the lower part of the gymnasium is comparatively static, although the cubic air space per capita is far more than would be required by any existent state regulation. The hourly flow of air per capita thus is far more important than is the per capita of cubic air space.

It will be urged that ventilating systems are unreliable and that natural ventilation is not always desirable. Both of these ob-

jections possess some force. On the other hand, is it not time that we made inquiry into the real value of cubic air space regulations as standards that are safe for the protection of communities from disease, discomfort and inefficiency? Is it safe to depend upon tradition unsupported by scientific data to guarantee well ventilated and safe places for infants, children and adults?

### The Training of a Medical Missionary.

—Although a medical missionary may not be like the poet, "born and not made," yet



in order to fulfill the position adequately he must possess certain natural qualifications, for the life of a missionary is never a bed of roses, and he will have to endure many hardships and discomforts. Also

he, or she, who seeks "to carry light into dark places" must be endowed with good mental faculties, be enthusiastic and possessed of a great deal of tact, this latter, by the way, being an especially necessary requisite in dealing with the natives not only of the Far East but of many other out of the way regions; above all the missionary of to-day must be thoroughly trained.

The changed conditions in missionary work were shown at the conference held by the Board of Missionary Preparation at the conference room, 25 Madison Avenue, New York City, on April 5th and 6th, 1916, at which the question of the medical training of missionaries was dealt with from all angles.

At the very outset it was pointed out that to-day the training of missionaries must of necessity be remarkably thorough. It should embrace, according to the views of those who read papers at the conference, and of those who took part in their discussion, not only a course of training in a Class A Medical School, but a preparatory course of attendance at high school for four years, and a college course of at least two years, including instruction in chemistry, physics, biology and French or German. Moreover, a third year and the full college curriculum, whenever possible is strongly recommended, in which in addition to the

regular course the study of sociology, psychology and pedagogy is advocated.

With regard to medical training it was proposed that this should be not less than a course of four years in a first class medical school, the regular curriculum to be followed, and no attempt to be made to specialize except by means of optional or elective courses.

So far as post graduate training is concerned, it was laid down that, at least, one year should be spent as interne in a good hospital, and further, it was strongly recommended that one year should be passed in post graduate study in subjects which are particularly important for missionary work, as surgery, obstetrics, diseases of women and children, diseases of the eye, ear, nose and throat, tropical diseases, preventive medicine, hygiene and sanitation. Especial stress was laid upon the desirability of medical missionaries being fairly well acquainted with the essentials of preventive medicine, hygiene and sanitation. In primitive countries in which the lot of the missionary is often cast, a knowledge of these subjects is of the utmost use, in fact, almost a *sine qua non*, for frequently in tropical countries an epidemic can be prevented by the prompt application of the principles of hygiene and sanitation.

A certain amount of special preparation is required of, or advisable for women who elect to work in the medical missionary field. In some countries to which they are sent, the religion of the natives forbid that their womankind should be attended by medical men. Thus, in addition to there being an almost unlimited scope for the service of female physicians and surgeons, it is also incumbent upon them that they should be efficiently trained in the diseases of women and children. Of course, a well-grounded knowledge of obstetrics is of the first importance, and to gain this knowledge, supplementary study and hospital experience are necessary.

It is a somewhat melancholy truth, that while women are urgently needed for medical missionary work, the supply is not nearly equal to the demand. This is not because women are not willing to embark on this career, for there are plenty who are anxious for a life which gives such opportunity for self-sacrifice and noble service, and which is besides out of the beaten track, but the

compelling reasons are (1st) that they are unable to afford the expense of medical training, and (2nd) that so few of the medical schools of the country are open to women medical students. Those that are open to women, being schools of the highest standard, are correspondingly expensive, indeed, often prohibitive in this respect to the majority of the class of women who are likely to take up the life of a medical missionary. It seems a pity and a shame that such matchless opportunities for women to aid and uplift suffering humanity should be shut to most of them on account of a sordid lack of money. Surely some way should be found to meet this problem.

In the next issue of AMERICAN MEDICINE will appear two very interesting and important papers read at the conference and dealing with special phases of the medical missionary question; one is by Professor Horace Arnold, Dean of the Graduate School of Medicine in Harvard University, and the other by Dr. Belle Allen, formerly physician in charge, Balter Hospital, Baroda, India. Dr. Arnold gives his views as to the preparation of the medical missionary while Dr. Allen deals with the preparation of women for medical missionary service, and how it should be differentiated, if at all, from that of men. Both papers are excellent.

The life of a medical missionary offers little or no inducements of gain or fame. It is a life frequently spent far from civilization and among people whose native habits and customs are repugnant to educated and refined Western men and women. Furthermore, it is a life always attended with a good deal of risk, and certainly demanding a high degree of self-abnegation. On the other hand, its compensations, to a person eager and anxious to do good—to be a benefactor of humanity—are obvious.

Finally, there is a spice of adventure in the medical missionary's life which is appealing to many men and women. It must constantly be borne in mind, however, that to succeed as a medical missionary, one not only has to be particularly well adapted for the work by temperament and constitution, but must be—and too great emphasis cannot be laid on this point—specially and thoroughly trained to meet the difficult and unexpected in medical practice and render in every instance under any and all conditions,

the highest type of medical service. Of all practitioners of medicine, the missionary to primitive people, can least afford to trust to "good luck."

**The Making of Books.**—A great many books are written which have no "raison d'être." In fact, many of them had better never have been published. A witty and caustic observer of bygone days once remarked: "Oh, that my enemy would write a book," and he was justified in thinking that a book which was an offence to the intelligence of its readers, would recoil on the head of its author. This plethora of books, so evident nowadays, may be ascribed to the love of, even mania for, notoriety, which marks this material age. The desire to be ever in the eyes of the public is not confined to professions other than the medical, but is probably as pronounced among physicians and surgeons as among all other classes. In the eyes of some, no means, whether ethical or not, are to be neglected which bring and keep a person's name in the limelight.

As a rule, when a member of the medical profession has made somewhat of a reputation he forthwith deems it his bounden duty to rush into print. It matters little whether he has something new to say or not, the publication of a book will serve to advertise the fact that he is more or less of an important man, at least, to those who are not cognizant of his limitations. However, it is refreshing to know that the really great men are generally speaking unassuming and humble. They know enough to know how little they know. Witness Pasteur, who is the best example of a genius, who at the same time, was wholly without pride or ostentation. Not long ago Dr. James Mackenzie of London was asked to prepare an article for publication. His answer was, "I never write unless I have something to say," and it might be well if

many less distinguished men would take this precept to heart. This, by the way, is a digression from the theme of these remarks, but is intended to point the moral that while many books, medical as well as lay, are superfluous, there is yet always room for those that are original or useful.

In this latter category readily falls a book written by Dr. R. Tanner Hewlett, Professor of Bacteriology in the University of London. It is his already well known *Manual of Bacteriology*, and the fact that it is in the fifth edition, is in itself sufficient evidence of the worth of the work. The word useful in designating this book is eminently fitting as it is packed with valuable information concerning bacteriology, phrased in concise and terse language. The reproach of being superfluous cannot be applied to Hewlett's *Manual*. The text of the former edition has been completely revised and brought into line with the most recent view of all that pertains to bacteriology. Moreover, a great deal of new material has been added and changes have been made in the chapters dealing with particular microorganisms, to wit, the streptococci, anthrax, tubercle, leprosy, typhoid fever and cholera bacilli. That part of the book treating of the purification of water and the bacteriology of milk and foods is especially complete and in thorough keeping with the latest scientific ideas on the subject. It should be said that the introduction to the book, in which the nature and history of bacteriology are sketched, is highly practical and interesting and is especially worthy of the attention of practitioners and students.

Above all the work throughout is distinguished by common sense and will be found exactly what its name implies, a manual of bacteriology, clinical and applied. It is excellently arranged, written without redundancy, in lucid phraseology, and the photomicrographs by which the text is adequately illustrated are well selected, clearly reproduced and greatly add to the value of the work. Dr. Hewlett is to be congratulated upon having written what is unquestionably the best manual of bacteriology in the English language and one which has been, and doubtless will continue to be almost as much appreciated in America as in Great Britain. Recent advances

in the science of bacteriology certainly call for such a work which renders the task of getting a firm grip on the elements and principles of the subject comparatively easy to medical students, while as a "vade mecum" to the busy practitioner it is equally valuable.

Civic hygiene, in a sense, is dependent upon personal hygiene. Few persons thoroughly appreciate the advantages of health to be derived by properly using the air or ingesting food. Few realize that the poisons manufactured within their bodies are equally as dangerous as those synthetically manufactured outside of the body. An authoritative expression of opinion on how to live naturally possesses unusual advantage. Fisher and Fisk, in a useful book on *How to Live*, Funk & Wag-nalls Company, 1916, present a business-like book that is in part designed to assist individuals to extend the term of their lives through improvement in individual hygiene. While essentially born of commercial purpose, it carries with it important lessons which, if followed, will react to the physical benefit of the reader.

Some moot points in hygiene are treated somewhat dogmatically but nevertheless vigorous opinion, whether right or wrong, is worthy of encouragement. Few persons can follow all the rules for hygiene but here at least is an opportunity to become acquainted with the most valuable among them.

For many years the emotional side of man's nature was more or less dissociated from his physical characteristics. The interpretation of the cause of emotional disturbances and the results of such disturbances upon the viscera have given rise to a growing literature. Walter B. Cannon, in *Bodily Changes in Pain, Hunger, Fear and Rage*, (D. Appleton & Company, 1915) presents a very valuable series of studies of the bodily alterations in conjunction with these emotional complexes.

The relation of the adrenal secretion, the alterations in blood sugar and the general variations of blood pressure, blood coagulation, and fatigue that are induced by pain and hunger apparently indicate strong re-

lations between the activity of the ductless glands and the emotional system. The visceral responses to intense feelings suggest many possibilities of transformation and substitution which may react to the advantage of the human race.

Practical suggestions grow from a conscious endeavor to fight emotions, instinctive in character, in such a way as to direct them along lines of conduct more helpful to civilization. Moral issues are developed on the basis of physical changes and from a study of pain and hunger. Especially interesting is the suggestion that the martial virtues may be preserved by supplying physical substitutes for warfare.

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The degree of civilization of nations may be indicated in part by the infant mortality and by the general laws relating to the welfare of infants and children. The humanitarian movements date back in a large measure to the economics of national existence.

The existence of infanticide, the drowning of daughters, the exposure of infants and the general sacrifice of children appear to be vested with mystic meaning to those unfamiliar with the development of nations. To learn the position of children in Greece, Rome, India, Arabia, and Canaan, and to follow their story through the dark ages of Europe is more than mere historical travel. It is dipping into the wells of human experience and touching the very blood of life. George Henry Payne in *The Child in Human Progress*, (G. P. Putnam's Sons, 1916) has most interestingly presented a review of the physical, economic and social existence of children from the era of primitive society down to the present date.

The shadows of child life appear to be very dark because the author has been looking away from the sun, though occasionally rays of brightness do filter in to illumine some particularly dark page in history.

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Regardless of one's agreement with the general kinetic theories of Crile, his attention is held and his interest aroused in the possibilities of Crile's theory as expounded in his recent book *A Mechanistic View of War and Peace*, (The Macmillan Company,

1915). Amid all the wails about foreign disaster, there is always comfort in hearing a note of optimism or seeing a glimpse of future brightness. A constructive plan for world redemption fixing responsibility for human action upon human beings may be called theoretical or Utopian, but it at least represents an intelligent endeavor to point out a higher road for intelligent nations. "Man at last may see that his destiny is in his own hands and that there is no active supernatural power that will help or hinder his career, in fact, that his destiny in part has been determined by his evolution—but that the balance is to be man-made here and now."

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The advantages now enjoyed by those who eat to live or live to eat are due to manifold changes in the food supply. Not merely cold storage but the development of new foods, the rise of the canning industry and the better understanding of the physiology of nutrition have been of manifest benefit to the welfare of mankind. These factors are excellently presented in *Changes in the Food Supply and Their Relation to Nutrition* by Lafayette B. Mendel, (Yale University Press, 1915).

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A cripple has been defined as "a person whose (muscular) movements are so far restricted by accident or disease as to affect his capacity for self-support." Simple as is this definition, the United States has no enumeration to indicate how many persons in this country come within the limitations of the definition. It has been estimated that the number of crippled children in the United States under the age of 14 years is 133,000, while the total number of children and adults crippled has been estimated to be 259,000. Figures such as these are merely suggestive of a tremendous problem which merits study and remedial action.

The total number of institutions for crippled children is not exceedingly stimulating. There are 10 orthopedic hospitals, 14 convalescent hospitals and homes and 13 asylum homes, together with a few institutions maintained for special work with crippled children exclusive of classes for

crippled children in public schools. Along with the physical care of children must be considered the special provisions necessary for their education.

For those interested in the problem of the maimed or diseased, whether in their physical care and development, their educational progress or their organized training for self-support, a mine of information is available in *Care and Education of Crippled Children* by Edith Reeves, (Survey Associates, 1914). Among the available features here presented are not merely the statistics of existing institutions but a brief description of the homes for crippled children in this country. The future of the movement, in behalf of crippled children, may be predicated on what has already been accomplished. Herein is a message of hope for the relief of needless suffering and the development of greater economic resources for the individual and community.

## BOOKS RECEIVED.

**A Mechanistic View of War and Peace.**—By George W. Crile, edited by Amy F. Rowland. Illustrated. Octavo pp. 104. New York. The Macmillan Company, 1915.

**Care and Education of Crippled Children in the United States.**—By Edith Reeves, Special Agent Department of Child-Helping, Russell Sage Foundation. Introduced by Hastings H. Hart, LL. D., Director Department of Child-Helping. Octavo pp. 201 + 43. New York. Survey Associates, Inc., 1914.

**The Child in Human Progress.**—By George Henry Payne, with a foreword by A. Jacobi, M. D., LL. D., with 40 illustrations. Price \$2.50. Octavo pp. 340 + 60. G. P. Putnam's Sons. New York and London. The Knickerbocker Press, 1916.

**Bodily Changes in Pain, Hunger, Fear and Rage.**—An account of Recent Researches into the Function of Emotional Excitement. By Walter B. Cannon, George Higginson Professor of Physiology in Harvard University. Octavo pp. 301 + 10. New York and London. D. Appleton and Company, 1915.

**How to Live.**—Rules for Healthful Living Based on Modern Science—Authorized by and Prepared in Collaboration with the Hygiene Reference Board of the Life Extension Institute, Inc. By Irving Fisher, Chairman, Professor of Political Economy, Yale University and Eugene Lyman Fisk, M. D., Director of Hygiene of The Institute. Third edition. Octavo pp. 324 + 20. Funk & Wagnalls Company, New York and London, 1916.

**Changes in the Food Supply and Their Relation to Nutrition.**—By Lafayette B. Mendel,

Professor of Physiological Chemistry in the Sheffield Scientific School of Yale University. Duodecimo, pp. 61. New Haven: Yale University Press, London: Humphrey Milford.

**Civilization and Climate.**—By Ellsworth Huntington, author of "The Pulse of Asia," "Palestine and Its Transformation." Octavo pp. 294 + 35. Price \$2.50. New Haven: Yale University Press, London: Humphrey Milford, Oxford University Press, 1915.

**The Basis of Symptoms.**—By Dr. Rudolph Krehl. Translation by Arthur Frederic Beinfeld, Ph. B., M. D. Published by J. B. Lippincott Co., Philadelphia. Price \$5.00.

**Treatise on Fractures.**—By John B. Roberts, M. D., F. A. C. S. and James Kelly, A. M., M. D. Published by J. B. Lippincott Co., Philadelphia. Price \$6.00.

**International Clinics.**—Vol. I, Twenty-sixth Series. Edited by Henry W. Cattell, M. D. Published by J. B. Lippincott Co., Philadelphia. Price \$2.00.

**Breathe and Be Well.**—By William Lee Howard, M. D. Published by Edward J. Clode, New York. Price \$1.00.

**Beauty a Duty.**—By Susanna Croxford. Published by Rand, McNally & Co., Chicago, Ill. Price \$2.00.

**Diseases of Nutrition and Infant Feeding.**—By John Lovett Morse, A. M., M. D., and Fritz B. Talbot, A. B., M. D. Published by The MacMillan Co., New York City. Price \$5.50.

**Diet for Children.**—By Louise E. Hogan. Published by Bobbs-Merrill Co., Indianapolis, Indiana. Price 75 cents.

**Man—An Adaptive Mechanism.**—By George W. Crile, M. D., F. A. C. S. Published by The MacMillan Company, New York. Price \$2.50.



**Vulvo-Vaginitis in Children.**—Isaac C. Abt (*Urologic and Cutaneous Review*, Apr.) discusses this subject in detail and says that the diagnosis in cases of vulvo-vaginitis is made from the abundant secretion, the redness, the swelling, etc. The older authors, men whose descriptions were read twenty and thirty years ago, thought this flux was due to some dyscrasia or to some constitutional condition. They described the disease occurring as a complication of scarlet fever, measles, typhoid and various exhaustion diseases.

We must not assume that all cases of discharge from the vagina of infants are gonorrhreal. There may be notable exceptions. For instance, a child that has aphthous ulcers in the

vaginal portion, or that has infection of some other kind, may be easily shown not to be suffering from gonorrhea. On the other hand, pus, from the vast majority of cases, containing the intracellular diplococci is assumed to be of gonococcal origin.

Very recently a method of diagnosis has been suggested which seems to me to be very valuable, and especially in those cases where doubt exists. It has been suggested to examine the vaginal washings. Kolmer and Pierce have adopted the suggestion of Van Gieson, which consists of injecting into the vagina, with a soft rubber syringe, or with medicine dropper, one to four or five thousand bichlorid solution in normal salt solution, and thus allowing the vagina to be ballooned out slightly, and withdrawing again with the same syringe these washings, and in this way obtaining the secretion from all portions of the vagina, and obtaining also the epithelium of the vagina and the pus cells. This is centrifuged slowly for a number of minutes, submitted to staining reactions, and tested for gonococci.

It has been suggested, too, that in some cases where this method failed, it might be well to irrigate with mild nitrate of silver solution, and then examine the washings by centrifuging as I have just described. This method of diagnosis seems of considerable value.

As to treatment, my own experience relates particularly to the methods of irrigation, such as sitz baths. I have tried almost everything for irrigation purposes, and I have thought I had good results in some cases, while in others I have not. Some of these cases will get well in a few weeks and do not seem to have relapses. Others again, particularly in older individuals, will improve and relapses will occur. The disease sometimes is very intractable and the end does not seem to be in sight.

It has been suggested in some of the recent literature that the hymen should in some way or other be scarified so as to prevent the secretion from flowing freely from the vaginal portion, or it should be destroyed under cocaine anesthesia. It has been suggested, furthermore, to mop out the vagina with a strong argyrol solution, and then follow this with irrigations of permanganate.

In a series of cases that have been tested with various kinds of treatment by Hamilton of New York, he suggested that the best remedy he has found is Condy's solution. He gets better results in treatment with this solution than with any other method.

So far as the vaccine treatment in children is concerned, there are others who are more expert and know more about it than I do. I may say, however, that I have seen positively no results with the vaccines that have been placed in my hands.

**Treatment of Tuberculosis of the Larynx.**—In his article on Diseases of the Nose, Throat and Ear (*Inter. Jour. of Surg.*, Feb., 1916) King says that the treatment of laryngeal tuberculosis should be local, hygienic, and constitu-

tional, along the same broad lines which are recognized as most suitable for pulmonary tuberculosis.

The local treatment depends upon the stage of the disease. In the mild incipient cases, little local treatment is needed. In the stage of infiltration and early ulceration, the intratracheal injection of a twenty per cent solution of menthol in liquid albolene is very efficacious. If there is irritation by lingual tonsils, they should be removed by cautery. The insufflation of orthoform powder has been recommended for the relief of pain. A light cauterization of the ulcer often has a good effect. Applications of lactic acid have been much in vogue in the past, but the author prefers the actual cautery when any caustic is necessary. Rest for the larynx, as nearly complete as possible, is necessary. Talking, loud laughing, singing, etc., are to be prohibited. The patient's communications should be made by writing.

The hygienic treatment of these cases is identical with that accepted as the best for pulmonary cases, i. e., a life spent in the open, with plenty of fresh air, sunshine, rest, and good nourishing food. A moderately cold dry climate is more suitable for these cases than are the temperate or warm climates. An elevation of about 2,000 feet seems to be the most suitable altitude for the majority of such patients. A location which has a maximum of sunshine is the one to be selected, other things being equal. In the majority of patients, the disease must be treated at home, as comparatively few sufferers can afford to select a climate where they will be obliged to live among strangers. No patient should be sent away from home without a careful inquiry into his financial condition. Often the mental anguish of those too poor to live in comfort away from home is so great that the trip does more harm than good. Even among the well-to-do, the question of the proper climate is a difficult one to decide, and frequently several locations are tried before a suitable one is found.

The diet should consist of everything which is agreeable to the patient and suitable to his digestion. The object is to maintain nutrition and strength, and, if possible, store up some reserve for a protracted illness. This object is best accomplished by a generous and nutritious diet. Too often a regimen of milk and eggs not only becomes distasteful to the patient, but actually is given in such quantities as to upset all the metabolic processes. Such a diet then does more harm than good.

The constitutional treatment consists in the administration of suitable drugs for specific objects. It may be necessary to give codein to control the cough, etc. In other words, the constitutional treatment is identical with that for pulmonary tuberculosis.

**Acute Catarrh of the Intestines.**—Butler (*Med. Brief*, Apr., 1916) in his article on Catarrh of the Intestines, gives the follow-

ing treatment for the diarrheal or constipation type. The diarrheal type demands a quiescent stage. In the severer cases, the patient is required to remain in bed. The more moderate cases are treated as ambulatory cases, but all active exercise which calls for increased exertion is prohibited. Fright and exposure to the elements should be avoided. "Catching cold," has a deleterious effect upon these patients.

As soon as we are satisfied that the diagnosis is correct, these patients are to be put upon a mild laxative, after thoroughly cleansing the bowel with castor oil, generally a combination of the phosphate, sulphate and bicarbonate of soda, equal parts and the mixture given in 2 gram (1½ drachm) doses, after meals. This may be varied by giving Carlsbad water in some cases. Frequently in the milder cases no other medication is required. Severer cases call for bismuth preparations, either the subnitrate, subgallate or salicylate, three or four times daily. I have used tannalbin with very gratifying results, in some cases, and occasionally use it in conjunction with the bismuth preparations. Opiates are never to be used except in the most extreme cases. Salol and other intestinal antiseptics are of little value.

In the cases in which constipation is the predominant factor, exercise is of great importance. These patients should be encouraged to walk, play golf, ride horseback or row every day, and do it systematically.

**Massage.**—Manual or vibratory, is indicated. Have the patient while still in bed, knead the abdomen gently with both hands, generally following the course of the colon, from the cecum to the sigmoid and then over the abdomen. A light common ball may be substituted for this method, but when properly done the manual massage is better than either the vibratory massage or the use of the common ball. Cold douches over the abdomen, every morning following the massage, aid very materially. The use of laxatives and cathartics in the constipated cases is to be avoided in every way possible, depending upon enteroclysis, exercise, and diet to regulate the bowels. When it is positively necessary to use laxatives, the liquid petroleum or regulin should be tried first; if they are not sufficient, some of the cascara preparations, aloin, belladonna and strychnin pill, or castor oil in large doses may be given, every night for a period of three or four weeks.

In both conditions enteroclysis is indicated, as described under enteritis, to be used every day for two or three weeks and thereafter as often as required when constipation is present.

In addition to the daily enemas, which the doctor should administer himself, patient should inject from half a pint to a pint of sterilized cotton-seed oil into the bowel just before retiring, and retain it over night. In many cases this is sufficient to keep the bowel patent.

If there is any indication of an ulcerative condition, the patient may use a 10 per cent solution of argyrol, putting 15 grams (½ oz.) into half a pint of warm water, letting the mixture remain in the bowel for fifteen or twenty minutes, and then be evacuated.

**The Vegetable-Mineral Salts in Rickets.**—In his prize discussion of the treatment of rickets (*New York Medical Journal*, April 1, 1916, p. 649) Harrower of Los Angeles, directs attention to five essentials that need to be accomplished: 1. Replace the missing mineral element—with calcium lactophosphate. 2. Replace the missing vitamins by suitable dietetic care. 3. Antagonize the ever-present tendency to acidosis—with sodium bicarbonate or citrate. 4. Enhance the mineral content of the blood—by giving the salts found in fresh vegetables and finally 5. Favor the restoration of the disturbed organic balance which is responsible for the disorganized mineral metabolism. This seems to be best accomplished by suitable organo-therapeutic measures.

The use of the vegetable-mineral salts is an important phase of the treatment not merely of rickets, but of many nutritional dyscrasias, and deserves closer attention and more frequent application by the profession. Referring to this particular phase of the treatment of rickets, Harrower says: "Another excellent dietetic adjuvant, I might better say therapeutic measure, is clear vegetable soup. Sometimes it may accomplish more than any of the direct remedies mentioned previously, since it contains Nature's minerals, which normally form the inorganic pabulum of the cells. The preparation of this soup is important, and incidentally, it will be found a most valuable remedy in many metabolic dyscrasias in adults as well as children, including rheumatism, malnutrition, certain neurasthenic conditions, etc."

"Spinach, potatoes (or well cleaned potato parings) carrots, turnips, fresh peas (with the pods) and, perhaps, a small amount of onions, are washed, cut up and covered with two or three times their volume of water. Raw wheat or bran may take the place of one or more of these vegetables, if desired. The exact ingredients or their relative amounts are not of such great moment. Simmer for three or more hours over a slow fire, strain without pressure. One to four ounces of this clear liquid may be given four times a day, with or between feedings. Bran water may be used also. It is prepared and given in approximately the same way."

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**Some Phases of Calculous Disease of the Kidney and Ureter.**—In his article (*Long Island Med. Jour.*, Mar., 1916) on calculous disease of the kidney and ureter, Pilcher gives the following treatment:

First, an X-ray (picture 1) should be taken to determine, if possible, the size and position of the stone. If the picture shows a calculus which seems small enough to pass through the ureter, it is indicated to give the patient the benefit of medical treatment, the details of which it is not necessary to discuss here. Sufice it to say that, of the 12 cases in which we advised preliminary medical treatment, the calculus was passed spontaneously in 8 cases (66 2-3 per cent); was extracted with the aid of the cystoscope in 2 cases (16 2-3 per cent); and demanded ureterotomy in 2 cases (16 2-3

per cent); i. e., *Surgical operation was avoided in 83½ per cent of the cases of small calculi.*

If the stone is not passed spontaneously, then a cystoscopic examination should be made. Cystoscopic methods instituted for removal of the stone, and the functional efficiency of the kidneys determined.

If the stone is confined to the kidney, a pyelolithotomy should be done if possible (Fig. 8), Nephrectomy being reserved for the hopelessly damaged kidney.

If the stone is confined to the ureter above the brim of the pelvis, it should be removed by the posterior lumbar route, as described by the essayist.

If the stone is contained in the vesical portion of the ureter, the stone should be removed through the bladder.

If the stone is contained in the pelvic portion of the ureter, the operator must choose his own method.

**Treatment of Common Colds with Vaccine Therapy.**—C. L. Larsen (*St. Paul Med. Jour.*, Mar., 1916) in his interesting article says any physician who has used vaccines in colds will soon become a convert to this method, especially if he uses them on himself during an attack. In this way he will not only appreciate their therapeutic value, but he will also thoroughly realize the harmlessness of these vaccines in acute infections.

Fisher, in a recent article on this subject, concludes his paper with the following summary:

1. Colds, so-called, are unquestionably due to infection by micro-organisms.
2. Colds are contagious.
3. Colds can be largely prevented by reasonable isolation of every case, and preventive inoculation.
4. Colds can be aborted or their course shortened by vaccine treatment.
5. The treatment of acute and chronic inflammation of the respiratory tract by vaccines is specific.

The doctor who off-hand condemns vaccines, has either never used them, has expected them to do the impossible, or he has not had the infecting germ in the vaccine used.

One would not knowingly drink water into which a servant or train employee had dipped his hands; and it is in large measure to avoid danger from contact with the hands of typhoid carriers and other infected persons that regulations have been issued by the Public Health Service looking toward the safeguarding of ice used upon passenger trains.

With the ordinary precautions which cleanliness suggests we may answer the question, how often and under what circumstances may ice produce disease? In the language of that eminent authority, George C. Whipple: "The answer of experimental bacteriology, as well as of experience, is, almost never, or so infrequently that it need never give concern to the water drinker who tinkles the ice in his glass, or to the dealer in food who uses ice to pack his perishable goods."

To summarize, then:

1. Clear ice is, of itself, as free from the danger of conveying infectious disease as we need wish.

2. Dirty or cloudy ice may be dangerous. It should not be placed in water nor on food which is to be eaten uncooked.

3. There may be danger in eating iced foods or using iced drinks if the ice is improperly handled when placed in contact with the drink or food.

4. We may eliminate all danger by avoiding the handling of ice with dirty hands, by washing the ice with pure water, and by using only clear ice.

5. The average laboring person does not always have the opportunity, even if he have the inclination, to cleanse his hands after attending to those necessities of nature which almost inevitably result in their contact with excreta which may contain the organisms of disease, even in apparently healthy people.

It is therefore impossible to overestimate the danger resulting from the handling of ice by unknown persons if the ice is placed in direct contact with drinking water. Consequently in hotels, cars, stations, and similar places where intelligent personal supervision is impracticable, those furnishing the water should be instructed, and indeed compelled by law, to adopt such means of cooling water as do not require direct contact of ice and water.



**Clean Ice.**—In an editorial on Safe and Unsafe Ice, *The Nurse*, Aug., 1915, says that the greatest danger connected with ice comes from the improper handling of this article of food. If ice is dragged across dirty streets and sidewalks, and distributed by hands which are not clean and often contain typhoid and other disease germs, there is some danger from it.

**On the Fate and the Action of Hot and Cold Drinks in the Stomach.**—Egan states (*Muenchener Med. Woch.*, Jan. 11, 1916), the old experience that cold drinks on an empty stomach may cause unpleasant sensations in individuals with affections of the stomach, liver, and gall ducts. Some patients may complain of pain, although others with the same ailments experience nothing unpleasant. In fistula cases whether hot or cold water is swallowed the temperature is said to be soon equalized. The claim has also been made that very cold water causes reflex closure of the pylorus, thus preventing chilling of the entire intestine; but this has not been borne out by animal experiment.

The unsatisfactory state of our knowledge of the subject has influenced the writer to study it afresh, with radiographic control. A contrast drink consisting of a barium sulphate suspension in milk and starch, which is unaltered by temperature changes, was employed for the purpose. The extremes used were— $2^{\circ}$  C. and  $55^{\circ}$ - $57^{\circ}$  C. In no case was the temperature a source of harm. For sufficient reasons the fluid was introduced by the duodenal tube, instead of by swallowing. It was possible by this method to withdraw the fluid at any time and substitute another. The amount introduced was invariably 100 c. c. All sorts of clinical material was utilized—young, healthy soldiers and the usual run of walking patients. The olive tip of the duodenal sound appeared in the radiogram, along with the contrast fluid, which was injected through the duodenal sound. After sufficient observation the fluid was siphoned out and the tube withdrawn. The summation of the work and results is as follows: the velocity with which drinks, shortly after their arrival in the completely fasting stomach, are again expelled depends wholly upon the individual kind of initial evacuation possessed by the stomach in question. This is not at all influenced by temperature differences, however notable. Water of the temperature of  $0^{\circ}$  C. as well as of  $57^{\circ}$  C. leaves the stomach at the same time. There is no activity on the part of the stomach in moderating the temperature. Again, in both the healthy and those affected with gastric disturbances there are those whose reaction to warm water differs from that to cold water. The latter is seen to cause stomach contractions of deep character, while warm water elicits only a superficial wave-motion. Such cases represent a minority, but are constant in their behavior. No rationale could be made to account for the two types, but the knowledge acquired will be of service in accounting for certain chemical phenomena.

**The Destruction of Body Vermin.**—Kinloch (*Brit. Med. Jour.*, June 19, 1915), gives the following:

1. The louse can be bred and reared in the incubator under suitable conditions of temperature and moisture. Constant conditions for breeding and rearing lice in the incubator remain to be determined.

2. Dry heat is more effective than moist heat in destroying lice and their eggs. The louse can be revived after immersion for one minute in water at  $100^{\circ}$  C. Exposure to a dry heat at the same temperature and for the same time appears to kill both lice and nits.

3. The paraffin bodies are actively insecticidal, and of these petrol is the most effective. Lice and their eggs are destroyed by immersion in petrol for one minute, and they may be killed by exposure to the vapor of petrol for half an hour.

4. Powerfully fatty solvents other than the paraffins are actively insecticidal. Benzene, toluene, and acetone are as toxic to lice as petrol. Certain chlorine derivatives of methane, ethane, and ethylene are more lethal to lice than

any other substances, and have the important merit of being non-inflammable. Immersion in the chlorine derivatives of ethane and ethylene immediately destroys all lice and nits, and exposure to the vapor of these substances for five minutes is equally destructive. Even soap solutions containing 2 per cent. of trichlorethylene or 10 per cent. of tetrachlorethane are capable of killing in half an hour at ordinary temperature all lice and nits.

5. A 25 per cent. solution of dichlorethylene or trichlorethylene in vaselin when applied to the human body has been found capable of exerting its insecticidal action for hours. The action of a 25 per cent. solution of petrol in vaselin is of shorter duration, but is also effective after some hours.

6. The common phenol disinfectants in their usual degrees of dilution for disinfectant purposes and at ordinary temperature fail to kill lice or nits, even after steeping for half an hour, but become efficient as insecticides if the temperature of the steeping tank is maintained at  $65^{\circ}$  C.

7. The volatile oils have no direct insecticidal effect. In a moist vapor of oil of wintergreen, oil of cloves, oil of caraway, oil of turpentine, oil of eucalyptus, oil of thyme, etc., lice live for many hours at body temperature, and can be revived after immersion in these oils.

8. Over solid substances, such as iodoform, camphor, and paraform, and in contact with them, and in contact with garments impregnated with sulphur, borax, black hellebore, alum, etc., lice appear to remain practically unaffected.

9. The hungry louse feeds on the human body previously anointed with sulphur ointment, balsam of Peru, mercury oleate ointment, chrysarobin ointment, stavesacre ointment, and hellebore ointment. The louse certainly prefers the clean body, but it can feed on the body thus anointed and thereafter survive.

10. It has still to be determined whether some of these agents that have been shown not to be actively insecticidal may not have, when rubbed on the body or placed in clothing, a useful repellent effect on body vermin.

For practical purposes it has been found that destruction of lice and nits is best secured by immersion of verminous garments and bedclothes in a petrol or benzene bath. Danger from fire and waste of petrol are avoided by using such a bath and extractor as are employed in a dry-cleaning apparatus. In such an apparatus 90 per cent. of the petrol or benzene is recovered for future use. A petrol or benzene bath is necessary, especially for uniforms and woolen garments generally. Where the clothing is such that it is not injured by immersion in water, steeping the garments for half an hour at  $12^{\circ}$  C. ( $54^{\circ}$  F.) in a soap solution containing 2 per cent. of trichlorethylene, or 10 per cent. of tetrachlorethane, secures destruction of lice and nits. Steeping for half an hour in a 5 per cent. solution of cyllin in water maintained at  $65^{\circ}$  C. ( $149^{\circ}$  F.) is also effective, and this temperature has no injurious shrinkage effect on woolen articles.

# American Medicine

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**Woe to the Vanquished.**—Concerning the direct fatalities of warfare, we have only vague conceptions. The deaths and injuries of combatants are carefully analyzed and recorded by the proper military agencies, but for those distant from the scenes of strife, it is almost impossible to picture the scenes of misery, destitution, crime, and disease which have followed in the wake of warfare.

"The Lot of the Innocent Bystander in War" as depicted by Thomas W. Jackson in *The Military Surgeon*, April, 1916, has not been a happy one. As an eye witness, he relates the afflictions of European countries in terms teeming with human sympathy. His brief recital almost creates a sense of oppression, though tinged with optimistic hopefulness.

The food shortages have been productive of malnutrition, inanition, and starvation. The non-combatants, women, children, aged, and incompetent persons are the real sufferers. All available food stuffs are virtually commandeered to satisfy the needs of the fighting forces. The civil population may be given the stones. It is needless to dwell upon the reasons for the existent lack of food, but it is patent that physical degeneration or death itself must follow prolonged limitation of a strength-giving dietary. Hunger, weakness, increased susceptibility to disease, psychic distress, terror, hopelessness and their congeners are concen-

trating their attacks upon the most helpless factors among the civil population.

The acquisition of foreign territory by force, the drives forward and back over lands ordinarily devoted to the arts of peace are not merely invasion, they are destruction. Bombardment carries hazards but the civil population must flee from incendiary attacks. Not merely does homelessness result, but exposure, which, in bitter winter, means frost-bite and death. Those who perchance escape the vindictive flames and lead are overcrowding other homes inadequate for their normal occupants. The brutality of homelessness adds to the crushing and overwhelming burden. Together with relative starvation and rooflessness follows the disease-inducing filth from unchanged clothing, stiffened with mire.

The breeding of vermin, particularly when groups of refugees are huddled together for mutual warmth and partial solace, contributes to the development of vermin-borne diseases, as typhus and relapsing fever. Add to this the lack of sanitary facilities and scantiness of potable water and the picture of desolation almost challenges belief.

The lack of male protectors, the unavailability of medical service, the dearth of drugs, the want of surgical dressings and appliances for the civil population and the horror of fresh impending disaster produce a situation so miserable, abject, and dis-

tressing as to baffle the pen of those who would describe it. The squalor, the sordidness, the blood and tears do not blend to beauty in the pigments of those holding the artist's brushes for posterity. These are far different scenes than are conjured up by the "pride, pomp and circumstance of glorious war."

**Grim-visaged war** callously frowns upon those who enter not into the fray. Upon civil populations, whose only crime is that they are non-combatants, is visited dire punishment. When martial history is truthfully written, the casualties admitted will not be merely those suffered by contending armies, but will embrace in their totals the direct and indirect deaths among the non-combatants. The high mortality above that normal to the country will reflect the non-combatants' toll to Mars.

The medical historian with large vision of the social consequences of military operations should be able to give to the world a story of vital interest. The cold cruel facts of warfare as spent upon civilians would yield a volume bringing anguish to the reader. The stalking spectres of the twin brothers, Hunger and Disease, have played, and are playing and will continue to play their parts in advancing martial desolation through the peaceful towns and villages in which the tramp of soldiers' feet has crushed humanity. The curses of the homeless, the shrieks of the outraged, and the wails of the helpless, though filling the air with horrible pitiful sounds, are silenced by the booming of cannons and the rattling roar of machine guns.

The destruction of the non-combatants by deaths worse than death in combat suggests the sad lot of the innocent bystander.

Let us then widen the connotations of Young's satirical words:

"One to destroy is murder by the law,  
And gibbets keep the lifted hand in awe;  
To murder thousands takes a specious  
name,  
War's glorious art, and gives immortal  
fame."

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**A Brief for the Ten Hour Law.**—One day rest in seven has the authority of the decalogue and is slowly being embodied in laws of various types. The place of rest, as an inalienable right, is constantly being called before the bar of judgment.

During the month of April the Supreme Court of the United States heard arguments on the constitutionality of the Oregon ten hour law, which statute forbids the employment of adult men longer than ten hours in twenty-four. This law has been upheld as constitutional by the Supreme Court of Oregon. The question now raised is whether this ten hour law is in conflict with the Fourteenth Amendment.

American legislation, limiting the hours of labor for men, has been enacted in various States of the Union in connection with mines, street railways, work done in private business, national, state or municipal government, and public employment. These legislative enactments have provided for eight hour laws, nine hour laws, ten hour laws, eleven hour laws, and clearly indicate that the restriction of hours of labor for adult males in certain cases is thoroughly justified.

In connection with the argument before the United States Supreme Court, there was presented a weighty human document—a

brief prepared by Josephine Goldmark under the direction of Mr. Brandeis, until his nomination as Associate Justice of the United States Supreme Court compelled him to withdraw from the case.

In connection with the various legal, economic, social, and moral considerations involved in a discussion of the hours of labor none is more vital than the medical and hygienic problems centering about this topic.

The relation of fatigue to the health and working capacity of human beings is a matter of great importance. Courts have already taken cognizance of the dangerous trades, and their regulation by statute has come to be a common practice. It is obvious, however, that practically every trade possesses some danger if the hours of work are inordinately prolonged. The brief provides a mass of common knowledge derived from the literature of many nations to indicate the potential injuries inherent in fatiguing labor.

After a consideration of the menaces of national vitality, generally recognized at present, the brief discusses the dangers of long hours. The specific ill effects of long hours on health are illustrated in a disquisition on the relation of fatigue to disease. The relation of fatigue to disease in general and particularly to infectious diseases and nervous diseases involves a vast amount of material hitherto isolated in the general literature.

**The health hazards of modern industry** are emphasized by the new strain of manufacture due to speed, monotony, and piece work as well as the injurious physical surroundings due to the lack of adequate sanitation in factories, shops, and institutions where work is performed.

The nature and effects of fatigue are constantly referred to by writers on occupational disease, and a summary of the present theories as to the origin of fatigue makes patent the importance of hours to repair the tissue damage incident to the expenditure of energy. The bad effects of long hours on safety as well as upon morals and the general welfare merit careful study by the medical profession.

From this very valuable compendium, it is evident that physicians have not been blind to the importance of fatigue as a disease producing agency. A large proportion of the authorities quoted belong to the medical profession. It is frequently asserted that physicians have neglected the general subject of industrial hygiene. The compilation here provided would tend to point out the fallaciousness of a statement of this kind. A very large part of the material quoted has been gathered from the writings of physicians in Great Britain, Germany, Austria, France, Belgium, Norway, Switzerland, Roumania, Italy and the United States. The existence of this vast literature was scarcely suspected by those interested in medical sociology and its compilation at this time makes it available to all students of public health.

Here again is further evidence of the important relations between social and economic questions and communal health. Hours of labor have generally been regarded as matters related to questions of strikes and lock-outs, labor disturbances or possibly to interesting civic problems in economics and sociology. It is certain, however, that excessive hours of labor constitute a serious medical problem, the understanding of which is especially necessary in order to constructively establish laws and ordinances to protect the community from preventable dis-

eases and accidents now bound up with industrial life.

Health officers, medical legislators and social-minded physicians will find inspiration for greater efforts in a perusal of the brief. Fortunately, the two volumes are to be reprinted by the National Consumers' League and are thus to be purchasable at a very low cost so that the splendid fund of information may be drawn upon freely by those interested in protecting the lives and limbs of the industrial population. The benefits of shorter hours will be manifest in the general welfare of society, the increase of leisure and recreation, an improved citizenship and a healthier community.

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**Medical Care for Children in Institutions.**—In the investigation of the various public charities of the City of New York by a Commissioner of the New York State Board of Charities, many facts were brought out reflecting upon the medical attention given in institutions for children. It has long been recognized that institutions are regrettable though necessary evils at the present time. The congregation of large groups of children under institutional care is in itself an insanitary procedure and prejudicial to the health interests of the inmates.

Unfortunately, the attending staff of many large institutions for children is inadequate in numbers and in consequence justice cannot be done to the maintenance of the health of the children. It is practically impossible for one physician to give proper care and attention to a thousand or eight hundred, particularly when the work forms but a small portion of the daily service of the physician. Under such circum-

stances regular inspections of the children at frequent intervals are a practical impossibility.

The fact that at one institution for boys about 100 cases of diseases of the eye were present is indicative of a lack of medical inspection. The frequent finding of ring-worm, eczema, pediculosis, otitis, and wretched dental conditions makes clear that improvement is urgently needed in the medical and dental care of institutional children.

A lack of clerical assistance and almost complete lack of laboratory facilities render it difficult to secure proper records and indeed oftentimes full diagnosis.

**The true function of a physician in connection with institutional work** is scarcely along lines of therapeutic activity. The maintenance of institutional health is the prime requisite. The rapidity with which epidemics of infectious diseases spread through institutions makes it important to have frequent medical inspections in order to detect the earliest sign of disease. It is not alone in the contagious and infectious diseases, however, that care must be taken, because the very basis of public health demands adequate service in raising the standard of personal health. Periodical physical examinations are essential and in order to make such examinations of true value, systematic records must be kept with great faithfulness.

Regarding the lack of nursing facilities, we are not concerned at the present moment, vital as is this shortcoming.

It is true that most institutions lack funds, and therefore there appears to be some financial excuse for the failure to provide the care which modern science demands. This excuse, however, does not hold true for the service that physicians are supposed to

## ***WHEN THE CALL CAME!***

***(Lexington 1775)***

Whenever Americans have been called upon to defend their homes and country the American doctor has been found near the firing line doing his part as loyally—and bravely—as the man with the rifle. T'was so in 1775. It will be the same—whenever the need arrives.

and should be expected to perform in connection with their duties as attending physicians. So long as gratuitous services are obtained, there is no reason why several physicians should not attend institutions and by dividing the work, more satisfactorily protect the welfare of their charges.

It is probably more advisable in large institutions to have a resident physician as part of the internal administrative force. Certainly an institution housing a thousand or more children has sufficient medical work of one type or another to require the full time service of a medical officer. To decrease institutional mortality, to lessen morbidity, to decrease the likelihood of epidemics, to safeguard the children from physical deterioration are sufficient warrant for the expenditure of funds to provide for a paid medical attendant. Probably in the long run, such medical service would more than pay for itself and result in a financial saving to the institution, regardless of the saving in health and life.

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**Sickness and Unemployment.**—In a report on unemployment among women in stores of Boston (*Bulletin of the United States Bureau of Labor Statistics*, No. 182) one notes that among the causes of unemployment, not arising from industrial conditions, sickness of the worker and sickness in the family of the worker stand out prominently. Among 1156 women regularly employed, 20.2 per cent of the unemployment was due to personal sickness and 10.6 per cent was due to sickness in the employee's family. Among saleswomen, 31.6 per cent of all unemployment reported was due to sickness. For every 24 days worked by saleswomen one was lost because of ill health.

The personal disadvantage of idleness, because of sickness, is no less important than its industrial significance. Women dependent on their earnings, do not absent themselves from work for slight causes. In fact there is a danger that they pursue their labors even though relatively incapacitated. When absent, they are a source of difficulty in well organized store management. When present, though partially sick, they cannot perform their duties with their wonted success, and are therefore less effective in establishing their own abilities or in carrying out their duties. Almost 80 per cent of the women studied reported absence from duty because of sickness with an average of two and a half weeks' duration. This would indicate that disease itself plays an important part in unemployment.

An unemployment survey made by the Metropolitan Life Insurance Company in conjunction with the Bureau of Labor Statistics of the Federal Government during 1915 (*Public Health Reports*, February 25, 1916), and covering over a million wage earners in selected cities of the United States, developed the significant fact that 11 per cent of the unemployment was caused by sickness or accident disability.

**Recent studies of health insurance** direct attention to the vast amount of preventable diseases which affect the vigor and efficiency of workers in all fields of human occupation. The economic cost of such illness inadequately presents the problem of sickness among wage earners. It is not merely the suffering of individuals which is of moment, but the scrapping of workers, so as to make them unemployable in their respective pursuits. Constant unemployment may be due to unemployability because of advanced age or because of mental defect or because of

permanent physical disability. Irregular employment may be caused by diseases unrelated to industry. Recognizing that much unemployment is due to sickness, the very state of unemployment, as it constantly exists, presents itself as a serious problem.

In *Public Health Bulletin*, No. 76, (Health Insurance—Its Relation to the Public Health—by Warren and Sydenstricker) attention is called to the fact that "poverty is not merely a cause of sickness; it is also a result of sickness." "A recent study of the causes of destitution in 31,000 cases in 43 industrial localities in the United States developed the fact that charity relief was required in about 21 per cent of the cases because of the illness of the family breadwinner and that 18 per cent more needed assistance because of the illness of another member of the family."

There is little doubt that sickness reduces the economic status of the family through extra expenditures, loss of wages, decreased efficiency and general demoralization. Thus indirectly many workers are involuntarily reduced to the ranks of casual laborers and their unemployment and even their unemployability is attributable to circumstances largely beyond their control. For such unemployment industry cannot be held wholly responsible.

**The Report of the Employers' Liability Commission** to the Legislature of the State of New York in 1911, pointed out that idleness may be due to disability as in the case of sickness, old age, industrial accident or disease. Secondly, "it may be due to personal failing of the unemployed for which the individual might be held responsible, such as intemperance, vagrancy, or general disinclination to work; or it may be due to personal deficiency for which the

individual ought not to be held responsible, such as lack of education and training, which parents were unable or unwilling to afford, and which the community did not compel." A third basis may be due to general conditions of industry.

All unnecessary idleness is pernicious. Unemployment due to preventable disease is particularly regrettable. Before it is possible to constructively devise an effective remedy against unemployment of this type, it is necessary that thorough investigation be made of the most frequent varieties of disease compelling absence from industrial occupation. Idleness itself is conducive to psychic deterioration and secondarily is responsible for the development of alcoholism, venereal diseases and many of the degenerative diseases which are at present on the increase in this country.

Merely to consider unemployment as an economic evil is to fall short of our responsibilities. In so far as sickness and accidents are recognizable causes, they offer an unusual field for medical activity. Industrial accidents and occupational diseases are now being given careful study, but investigations must reach back to those accidents and diseases for which industry is not to be held directly responsible. A large proportion of unemployment is distinctly a medical problem. Our hospitals and dispensaries could yield much light upon this serious problem, and thus serve as the basis for greater preventive efforts.

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**The Fallibility of Animal Experimentation**.—has been shouted from the housetops by the antivivisectionists until they have spoiled their propaganda by their absurd statements. The use of animals for experi-

mental investigative work has enabled the medical profession to attain heights of therapeutic and diagnostic success quite unattainable otherwise. There is plenty of evidence which has been carefully collated and served up in intelligent style for all who care to read it. It is not our purpose, however, to defend animal experimentation but rather to set down a word of caution as to the fallacy of accepting as fact every experimental result obtained in this manner.

While our present knowledge of the utility of such well-established remedies as salvarsan or diphtheria antitoxin, has been largely attained by experiments without number on animals, we cannot always compare the reaction of an animal to a certain drug with the corresponding reaction of the human being to the same remedy. Without a doubt it is more rational and satisfactory to test the toxicity of a given drug on animals than on human beings, and such information is much more conveniently obtained in this manner; but like many a phase of the complex work of the medical man, one cannot invariably draw hard and fast conclusions from this form of investigative work, for too many factors which are beyond our control enter into such procedures.

For instance, a certain remedy is advocated for the treatment of a certain condition or symptom-complex. It is presumed that certain physiological reactions may be expected from its administration and that these reactions may be shown experimentally, or not, as the case may be. A dog is prepared for the test. If necessary it is anesthetized, certain organs are laid bare, and the remedy is given, usually by intravenous injection, so that the immediate results may be noticed. In some instances a musculo-stimulant influence may be immediately seen, or excito-secretory effects are obvious,

or again the action upon the heart, vessels or blood pressure is easily demonstrable. Always, however, these results are those of an intravenous injection upon an anesthetized animal under the peculiar conditions of such a test.

So definite conclusions cannot consistently be drawn as to the influence of such a remedy upon sick human beings with a physiological responsiveness differing very greatly from that of a normal dog under such abnormal conditions. It is true that suggestive deductions may be made, and that they may be a reasonable basis for further clinical study. It is equally true that dependable conclusions can only be drawn from the clinical application of this measure or that, in a number of as nearly similar cases as possible.

Animal experimentation may have opened up the way and given confidence in a certain prospectively useful measure, but that is all. Too often investigators, and especially those who have some preconceived notion that they are desirous of confirming and who are essentially experimentalists rather than clinicians, draw improper conclusions from their animal experiments and such reports are incorrect and subject to revision. We believe that some of the recent criticisms of the therapeutic efficacy of the hypophosphites are in this category. We care not how much experimental proof (on animals) there is that the hypophosphites are not absorbed and are therapeutically useless, provided we can continue to prescribe them with the results we have been able to obtain for fifty years and more.

**A couple of instances** which confirm this impression have been noticed in recent current medical literature. Both of these remarks were casually mentioned in a con-

sideration of matters quite remote from that under discussion here, and the professional eminence of the writers gives such statements added weight.

In a paper on "Autogenous Vaccines in the Treatment of Bronchitis and Asthma" read before the Mississippi Valley Medical Association by Dr. Robert H. Babcock of Chicago, (*Lancet-Clinic*, Feb. 12, 1916, p. 139) he makes some pertinent remarks about the dependence that has heretofore been laid upon expectorants in the therapeutics of bronchial disorders. He then says: "With certain limitations I still entertain a belief in their efficacy, notwithstanding some recently reported animal experiments which seemed to prove that in healthy dogs expectorants failed to increase bronchial secretion. When one has prescribed a remedy of this class to a patient with all the symptoms of chronic bronchitis and after its use for a week or so has seen cough lessen or disappear and the lungs clear up, he must be a therapeutic nihilist, indeed, who would claim the change to be purely accidental."

Experimentally it seemed quite well established that certain doses of certain expectorants given to *healthy animals*, had little or no beneficial effect—and from work of this kind it is hinted that our years of experience in actual clinical work have given us a misconceived idea of the value of the expectorant remedy being considered!

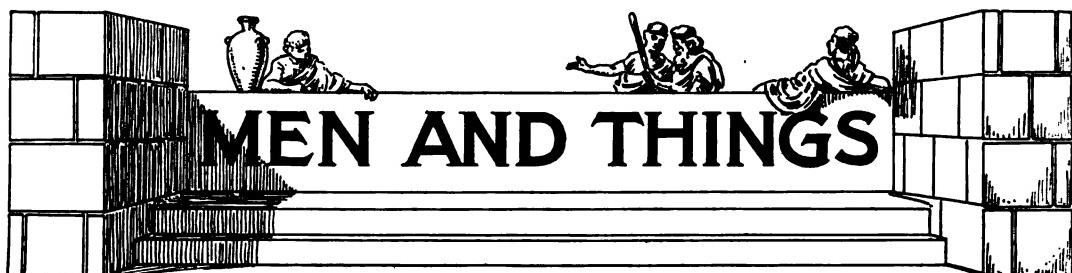
Again in Thomas L. Satterthwaite's interesting article on "Drug Therapy in Cardio-Vascular Diseases" (*International Clinics*, 1916, vol 1, p. 26) he says, in referring to the therapeutic value of cactus: "I am aware that experimentation on animals has been used to prove that cactus is inert, whether given by mouth or vein, but on this point clinical experience appears to have

demonstrated its utility," and Satterthwaite goes on to outline the particular class of cases and the preferred dosage of cactus in the treatment of cardiac affections. What of the apparently scientific reports published in one of our contemporaries some time ago as to the uselessness of cactus—in its experimental administration to dogs?

We cannot but believe that experimentalists are just as prone to err or to "jump at conclusions" as they so often accuse physicians of doing, and with these quotations in mind it will not be difficult to recall other similar cases and to agree with Professor Hare in his very apt and sensible statement (*Journal A. M. A.*, Jan. 29, 1916, p. 331) to the effect that the reaching of dogmatic conclusions based on evidence which is largely fictitious, results in the casual reader often being misinformed and led to discard a drug which, possibly, may render him good service in time of need.

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**The Special Acidosis Number.**—Our great Rheumatism Number last June met with remarkable success. It has been universally admitted to be the most important contribution to the subject thus far made, and much significance is attached to the fact that in spite of its size the whole edition has been nearly exhausted. It did not seem possible that we could issue a greater number on any subject, and yet the number for next month on "Acidosis" will actually surpass it. Without the slightest exaggeration it can be said that this forthcoming issue will carry more practical and important information on a single topic—and from men qualified to discuss it—than has ever been essayed in a single issue by any monthly medical journal in this or any other country.



**Scurvy Versus Pasteurized Milk.**—The *Weekly Bulletin of the Department of Health* (April 29, 1916) refers to a discussion on the increase of infantile scurvy due to the widespread use of pasteurized milk. In view of the fact that the National Commission on Milk Standards has placed itself on record as regarding pasteurized milk as the safest milk for general use, it is important to determine the validity of the alleged facts.

Pasteurized milk has been widely introduced throughout the United States and practically 98 per cent of the present milk supply in New York City is of this class. It is not desirable to raise questions of doubt needlessly in the minds of the public as to the sanitary value of pasteurization. There are no data available to indicate that the introduction of pasteurized milk has been accompanied by a general increase in scurvy. It is possible that data are lacking because no morbidity statistics exist to indicate the amount of infantile sickness of any type. In so far as death rates may be taken as criteria, it is noteworthy that the death rate in the State of New York evidences no increase, but there have been marked decreases, as for example, a drop of 50 per cent in 1913 as opposed to 1912.

The death rate from diarrhea and enteritis is 700 per cent greater than that of scurvy. In addition, a large number of infectious and contagious diseases are disseminated through infected raw milk. Considering the death rate, therefore, from scurvy in relation to the preventive results from pasteurization, it is patent that scurvy is practically a negligible disease compared with the great dangers inherent in the use of non-pasteurized milk.

The studies of Park and Holt (1902-1903) indicated that the use of heated milk

was a large factor in decreasing the infant mortality in hot months. While it has been repeatedly stated that boiled milk may predispose infants to scurvy, it is quite possible that the overheating of the milk is a most important factor. While it has been claimed that milk pasteurized at 145 degrees for twenty minutes does not destroy enzymes, it is evident from the studies of Hess that the destruction of enzymes or vitamines may occur even at this temperature. His investigation clearly shows that mild scurvy may be caused by a diet limited to pasteurized milk. The fact remains, however, that scurvy occurs in children fed upon unpasteurized milk as well as pasteurized milk and even among those who are breast fed. In the case of infants contracting scurvy while on breast feeding, it is probable that the diet of the mother lacks the essential vitamines just as has been demonstrated in the case of nurslings who contract beri-beri.

If it be true that clinicians are seeing more children with scurvy than formerly, it is possibly true that the reason is to be found in the fact that scurvy is more frequently diagnosed to-day than was the case a few years ago. Admitting that children being fed merely upon pasteurized milk may contract scurvy, it is very probable that the alleged increase is due to its earlier recognition and not to an absolute increase in numbers.

While vitamines may be destroyed by pasteurization and deficiency diseases, such as scurvy, result, the promptness with which infantile scurvy is cured by the administration of orange juice, orange peel water or potato water indicates that the existence of the disease is fraught with very little danger to the community. This is of especial importance when contrasted with the seri-

ousness of infantile diarrheas with their attendant high mortality indicating the difficulties of cure.

On the other hand general knowledge among physicians that artificial feedings of all kinds constitute a factor in the causation of scurvy has led to the almost general introduction of orange juice into the infant's dietary before the child has reached the age of six months. Regardless of the type of

proving pasteurized milk as a helpful means of reducing infant mortality. The few cases of scurvy now existent were preventable. The occasional cases occurring may be promptly cured. From the standpoint of public health education, it is unwise to create unnecessary fears on the part of the public with reference to pasteurized milk. The term "scurvy" possesses meanings for the laity far more serious than those



SIR JAMES GRANT, A. M., M. D., OTTAWA, CANADA.

food utilized, there is today scarcely an excuse for the development of scurvy. Orange juice or orange peel water or potato water may be given to infants of the age of three months if necessary and vegetable waters may be added at the age of six months. With such nutritional methods sufficient vitamines are introduced to prevent the occurrence of scurvy. The occurrence of scurvy is a criticism of feeding methods. It does not represent a reason for discouraging milk pasteurization.

There is every reason, therefore, for ap-

held by physicians. Every effort should be made to point out the practical advantages of pasteurized milk in protecting public health and in safeguarding infant lives.

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**The Etiology of Disease.**—We have long accepted the views of our teachers that the habitual use of alcoholics, tobacco, coffee and tea are etiological factors of great influence in heart diseases. Current medical literature constantly re-

minds us of heart complications depending largely, if not mainly upon the use of these products. They are also said to be a factor in the causation of cancer in a large number of instances. We are solemnly warned against the use of any of these articles and led to believe by well known writers—in some measure accepted authorities—that alcohol, tobacco, coffee and tea are poisons and as such should never be indulged in; total abstinence from all of these luxuries—the majority of men regard some one of them as a necessity—is the only safeguard to health, wealth and happiness.

Now right in the face of this dictum comes a Boston physician with the faith of his convictions strong in him, who in a study of one hundred cases of his own, of auricular fibrillation in the Massachusetts General Hospital, Boston, Mass., together with over one thousand recorded cases of clinical disorders of the heart, declares that "the excessive use of alcohol, tobacco, coffee and tea apparently played no direct part in the production of the important disorders of the heart beat; a history of previous indulgence was obtained more often from the patients with normal cardiac mechanism than from those with serious disorders of the heart beat."

The above statement was made by Paul D. White, M. D., of Boston in a paper, "Observations upon the Etiology and Treatment of Heart Disease," read before the Mississippi Valley Medical Association, Lexington, Ky., October 19, 1915, and published in the *Cincinnati Lancet Clinic* (November 28, 1915, pp. 470-472).

Dr. White's studies include 930 cases (besides his own 100 cases) reported as follows:

Gravier, L.: <i>L'Alternance du Coeur. Etude Critique et Clinique</i> , Paris, 1914 .....	88
Lewis, Th.: <i>Clinical Disorders of the Heart Beat, Second Edition</i> , London, 1913....	152
Ritchie, W. T.: <i>Auricular Flutter</i> , Edinburgh and London, 1914 .....	53
Carter, E. P.: <i>Archives of Internal Medicine</i> XIII, 803, 1914 .....	37
Cabot, R. C.: <i>Journal American Medical Association</i> (LXIII, 1461, 1914) .....	600
and White, Paul D.: <i>Lancet Clinic</i> (Nov. 27, 1915) .....	100

1030

thing, to convey information which will afford a safe and truthful guide, they must be based upon facts. It will not do to ascribe an obscure disease or complaint to a cause, definite in name, because we cannot establish the correct etiology. Coincidentally it may be stated with perfect truth that there are as many causes for cancer as there are cures. These causes are beyond computation. It cannot be otherwise for if there were one or a few generally recognized causes for cancer, there would be but few cures. There are those still who believe Friday an unlucky day; 13 an unlucky number. So too that heart diseases as well as cancer are caused by the use of alcoholics, tobacco, coffee and tea. Were it not for the fact that nearly all adults in the world indulge in one or all of these articles the causation factor in these diseases would be simplified. If malaria were unknown in a district it would not be safe to declare that all seemingly obscure deaths were the result of that disease.

We now know of but one cause for malaria, one for yellow fever, one for syphilis. For many years we had as many causes of, and treatments for malaria as we now have for cancer.

That the intemperate or excessive use of alcohol, tobacco, coffee and tea may lead to well defined physical as well as mental distress is obvious to all physicians, and in a limited measure to intelligent laymen, but all men are not given to excesses in this or any other direction. It is also true that these articles can not be indulged in even moderately by some without causing some measure of harm. This is true also of numerous articles of diet regarded as wholesome by nearly all persons, but that to an infinitesimal or negligible number, invariably prove harmful. In respect to our habits, occupations, environment the same holds true. Still again some individuals are susceptible to disease, others immune. In spite of the indefinite or contradictory character of much of our knowledge in regard to the causation of disease, we should still seek to be as scientifically accurate as possible in our public statements on health topics. The individual patient as well as the public demand it; besides great harm is done to medical science by careless exposition of these conflicting theories. The people become critical and credulous of all medical knowl-

**Here surely is food for serious thought**  
and study. If our statistics are to mean any-

edge when so many simple facts apparently fail to agree. Too many theories hastily announced discredit the profession. There is no substitute for truth. Painstaking, well balanced, accurate scientific study will in time lead to results, but in the meantime we should not place too strict a censorship upon the people's habits without the restrictions are first proven accurate. After all it is the individual, not the entire community that is in need of advice on medical matters. Individualities count rather than generalities, when it is the individual only through whom the general uplift of man can be brought about.

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**Fearful Nicotine?**—Fanaticism along any line blunts the senses and obtunds the intellect. Particularly vehement have been the assaults of those seeking to abolish the use of tobacco. The consideration of scientific information is more or less neglected by those whose mental strabismus compels them to view things in an abnormal way. A single quotation from a recent communication illustrates the unscientific attitude of fanatics:

"I repeat, hot nicotine fumes (tobacco smoking) inflame membranes, thereby increasing temperature constantly above normal 20 to 25 per cent.—a low fever—destroying tissue of the human flesh, baking the roots of the hair, causing baldness and premature grayness—whiteness; spreading the pupil of the eye, impairing the eyesight; also impairing the hearing. This is not all by half, directly and indirectly, that tobacco smoking (hot nicotine fumes) does to human health. For instance—just as one instance—all baldheads are smokers; let this be your cue-sufficient to at least excite curiosity if not enlist scrutiny and, it is hoped, provoke inquiry." Such a statement does excite curiosity and should provoke inquiry into the mental state of one who makes such unusual and startling statements.

Arguments based upon such theories are hardly provocative of faith in the integrity of the anti-smoking crusader. "Women are rarely baldheaded; reason, they don't smoke." To prevent tuberculosis eliminate tobacco; to reduce immorality and paresis, wipe out nicotine; to avoid epilepsy or paralysis, safeguard human health and hap-

piness by doing away with tobacco smoking. Verily, money is not the root of all evils, except the lucre invested in the tobacco business.

Undoubtedly, it is such ridiculous, ill-founded conclusions that do most to prevent any good being derived from the efforts of over zealous reformers. When will those who seek to correct personal habits realize that it is in the abuse of most things that the evil is found, not in their reasonable use? There is hardly anything associated with life or living that is not subject to abuse. Some day those moved to save their fellows from excesses will awaken to the fact that success lies not in extravagant denunciation but in education—the practical exposition of the benefits of rational use.

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**Longevity of Public Servants.**—

Whether universal longevity is desirable or not, studies as to the best methods of securing it possess more than theoretical interest. Irving Fisher, in the *Quarterly Publications of the American Statistical Association*, March, 1916, presents a study of the mortality of our public men. While primarily based upon the lives of senators and representatives, it includes facts as to the longevity of presidents, vice-presidents and congressmen in the United States.

Omitting the three living presidents, the longevity of our presidents is only 82 per cent of that expected according to the American Experience Table of Mortality. It is noteworthy that the longevity of presidents appears to be diminishing with the increasing complexity of life in Washington. The same tendency is evidenced among the vice-presidents and the congressmen.

The responsibility of public service is not the chief reason for shortening the lives of public servants. According to Fisher "The chief causes of wear and tear on the lives of congressmen are the same as those applying to modern convivial social life in general." Wherefore, the stress and strains of anxious moments growing out of public service are less serious in effect than the method of living brought about during public service. In a sense, the public servant is virtually giving of his life, when he gives his time, his brains, and his energy for the betterment of national conditions, though not because of this service.

The strictly scientific phase of "scientific management" can now receive considerably more attention since many of the facts elucidated by careful statistical research, are available for mature consideration. The question of fatigue from an economic standpoint appears to be as important from the medical side as it is convincing from its practical study.

To carefully study the findings that have been tabulated in an interim report of a committee appointed by the British Association for the Advancement of Science as set forth in a series of articles in *The Lancet* (1915 CLXXXIX, 1261 and 1309) is to be thoroughly convinced that the 8-hour day is rational in a purely physiological sense, and that the reduction of 9- or 10-hour days to the 8-hour standard, is not merely a benefit to the worker, but a decided financial object to the employer.

We have read with much interest reports of the results of Mr. Frederick Taylor's epoch-making innovation into American business; and we also have noted the increasingly prevalent desire on the part of factory workers to have their working hours reduced and the equally prevalent desire on the part of many of their employers to avoid this "additional expense" and all along we have felt that eight hours was indeed the physiologic limit of concentration at most of the machine-like duties which constitute so large a part of the factory worker's occupation.

It is impossible here to enumerate the quite convincing facts and figures in the foregoing report; but a few succinct examples will give weight to our opinion and will show that from a medical standpoint the 8-hour day is to be commended as both right and proper.

A firm of calico printers stated that they had tried to run their mill 15 hours a day and had so large an amount of spoiled work that they were compelled to shorten the hours. As a result the proportion of spoiled work fell and the output was largely increased. At a certain iron-works a 48-hour week was introduced and the production was increased relatively as compared with previous years when 54 hours had been the rule.

A firm of chemical manufacturers tried the effects of introducing three shifts of eight hours, and as a result the output

equalled the previous output of ten hours' work while the earnings, all on a piecework basis, equalled the previous earnings. In this case the increase of output and wages per hour was nearly one-third greater and the effects on the health and sobriety were remarkable. Besides this the actual cost of production was reduced 33 per cent. per ton of roasted ore.

It may be recalled that at the famous optical works of Carl Ziess at Jena, an 8-hour day was substituted for a 9-hour day by Herr Abbé. As a result the men earned by piecework an average of three percent. more than they had earned the previous year on a 9-hour basis, and the earnings, per hour, increased in the ratio 100: 116 while no special effort was made to accomplish this and the men were surprised to find their earnings increased.

From the standpoint of physiology it will be found that the 8-hour day is an advantage, for the health of the workers will benefit and this will be reflected in their work and consequently in their employer's balance sheet.

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**The Declining Death Rate from Tuberculosis** is an encouraging feature of the mass of vital statistics which has been put on record during the past 10 or 15 years. In the United States this figure has been reduced gradually from 180.5 per hundred thousand to 122.8. It is lower at the present time than it has ever been, and we confidently believe that it will continue to decrease.

Undoubtedly the greatest factor in bringing about this hopeful circumstance is *education*, and the increasing appreciation of the frequency, dangers and care of tuberculosis has stimulated the concerted efforts that are now being carried on in all parts of the country by public and private organizations. The education of the individual as carried out in numerous ways, has been of much value in bringing down these mortality figures, but we believe the greatest factor of all has been the acceptance by the State authorities of the oft reiterated fact that the care of the tuberculous rightly devolves upon the State.

The truth of this is very conclusively shown in some interesting statistics prepar-

ed for the Prudential Life Insurance Company, under the able direction of Mr. F. L. Hoffman. These figures show that the death rate from tuberculosis has been reduced in a greater degree in states like Massachusetts, Pennsylvania or Ohio, where definite plans have been laid and are being effectively carried out to control the great white plague. Obviously the study of these figures will stimulate greater energy and thoroughness in all who are doing this most useful and profitable service to humanity; and those states in which the grip of the authorities on the tuberculosis problem can be tightened, should not begrudge the money which is so necessary to accomplish this.

Incidentally, it is our opinion that the proposed Federal bill to provide a subsidy by the United States Government to be used in the care of non-resident indigent tuberculous individuals will be passed shortly; that this difficult problem of the authorities in many of the Western states will be solved; and its salutary influence be reflected upon the statistics of the next decade.

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#### Sir James Grant and Serum Therapy.—

In these days, when treatment by means of vaccines and serums may be said to be almost universal and when almost every day is bringing forth some advance in serum therapy, it is exceedingly interesting to learn that this mode of combatting and oftentimes conquering disease is not so new or recent in its origin as it is generally thought to be. Once again is impressed upon us the truth of the old adage that there is nothing absolutely new under the sun, for we find that Sir James Grant, the grand old man of medicine in Canada, anticipated to a considerable extent the researches of Virchow, Pasteur, Koch, Lister and others which resulted in revolutionizing bacteriology and in placing another and most effective weapon in the hands of those whose vocation it is to fight against disease. It was as far back as 1861 that this veteran physician of Canada first conceived the idea that the principle of vaccination might be extended far beyond the limits of the conferring of immunity, or comparative immunity, against smallpox. The story of how the notion germinated and took root in his mind is in

a high degree interesting. In the year 1861 Dr. James Grant, as he then was known, was physician to the General Protestant Hospital, Ottawa, and on a certain occasion assisted the late Dr. Hamnet Hill in a surgical operation. During the operation he became infected, and being in a poor state of health, developed a severe septicemia. The outcome of this infection, however, was somewhat extraordinary, for his recovery was so complete that his entire system appeared to be thoroughly purged of its poisons and for the past fifty years his health has been such that he has not been incapacitated from work for a single day. He concluded long ago, therefore, that a poison from without had created some condition within his system, that gave him immunity to infection, and accordingly he carried on researches along these lines, in particular applying the principle to the treatment of patients with skin disease with conspicuous success. At the time Dr. Grant reached these conclusions, he pointed out that the results he had obtained from the simple process of vaccination proved that the method should not be confined alone to its protective influence against smallpox, but should also be extended to the treatment of many cutaneous diseases. He further drew attention to the fact that such data proved nothing unfavorable to the claims of vaccination as a protective agent against smallpox; they merely proved that which each day's experience tended to corroborate, namely, "that man has still much to learn."

We have much pleasure in according to Sir James Grant the honor of being a pioneer in the field of serum therapy, an honor which is justly his due. Others have reaped where he has sown, but at least, it may be said that while he did not carry out his view to full fruition, he, at any rate, blazed the trail and pointed the way. It frequently occurs that those who first get an inkling of a most important discovery, for one reason or another are not able to prosecute the work of research to its ultimate consummation, and too often their names lapse into oblivion. Sir James Grant has been more fortunate than many original workers, for not only is his name almost a household word in Canada, but it is now being recognized that his part in the initiation of serum therapy was no small one.

**Real Drug Stores.**—There are drug stores and—drug stores. The notable change that has taken place in the character of the average drug store has made it a drug store in name only. Indeed not a few have taken on the aspects of an ice cream parlor, a cigar and candy store, a patent medicine emporium, or in extreme cases, a real department store. The drug department in many of these establishments has been conspicuous by its insignificance. The proprietor, in many instances, has apparently preferred to make a sale of a bottle of Lydia Pinkham's or Father John's Syrup to compounding a prescription.

Can it be wondered at that medical men have developed an antagonism to such hermaphroditic pharmacies? Can a doctor be blamed for objecting to send a patient with a prescription to be filled, to a store where the clerks will not let any patron get away without recommending some of their own specialties, "in case the doctor's medicine fails to work!" Or, again, can a doctor be blamed if when he examines a patient's prescription and finds it a substitute for what he ordered, he decides to send no more prescriptions to the drug store thus found guilty? It is these various conditions that have led medical men to feel that the average druggist is not trustworthy. Investigations undertaken in New York City have seemed to substantiate this opinion, at least in respect to a considerable proportion of drug stores, and if the druggist complains at the falling off of medical patronage, he can only blame the lack of confidence that has developed from the nefarious practices of the unscrupulous members of the drug profession. We say "of the unscrupulous members," for we know that a great many druggists are honest, trustworthy men, who would no more be guilty of sophisticating a prescription than they would of stealing. Unfortunately the innocent have to suffer for the sins of the guilty, and although probably a majority of the pharmacists in business today are deserving of implicit trust, the whole profession has been stigmatized by the evil acts of the vicious minority.

**The Drug Profession is Waking Up.**—Fortunately there are those engaged in pharmacy who realize that the druggist has

wandered too far afield, that though honest themselves and jealous of their reputations, they have viewed with too great indifference, the evil acts of the unscrupulous, substituting members of their profession. Many therefore, are seeing the necessity for cleaning up, for getting back to first principles, and realizing that pharmacy is a profession, with aims, opportunities, obligations and ethics closely similar to those of medicine. As a consequence, there are drug stores—many of them—where prescriptions are compounded by men whose knowledge, skill and integrity are to be trusted; in other words, real pharmacies where the doctor can be sure that his prescription will receive as great skill, care and adherence to ideals in its compounding, as he employed in its writing.

Although the profession of pharmacy has made marked progress recently in the direction of scientific service, too many drug stores still retain their heterogeneous character. A few—a very few—have dared to become drug stores in the true sense of the word—but the great majority are still department stores with reliable drug departments. The improvement in the drug departments is gratifying, but the great success made by the few that are real drug stores—and nothing else—would seem to have set an attractive example to many others.

As we conclude these random remarks we are told that the rumor is current that a great chain of scientific prescription pharmacies is shortly to be established. We are informed that there is a demand for drug stores restricted to the sale of medical and surgical supplies; drug stores conducted on a scientific, professional basis and as high ethical plane as the practice of medicine. This chain of scientifically conducted pharmacies is to cater to these demands, and base their hope and expectation of success on the service to be rendered the doctor and his patient along strictly medical lines. That such a plan will win a gratifying success is certain, for while medical men have an irreconcilable prejudice against the department drug store that carries its drugs merely as a side line, they recognize the benefits to be derived from scientific pharmacy and will gladly—yes, enthusiastically—patronize drug stores that are actually what they purport to be.



## A CASUISTIC CONTRIBUTION TO THE TREATMENT OF PULMO- NARY DISEASES WITH RADIOTHERAPY.<sup>1</sup> (Corpuscular Radiotherapy).

BY

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A few weeks ago attention had been called to the therapeutic attempts of a successful treatment in pulmonary tuberculosis by a select combination of dietetic, medicinal and physical means. So often in medical history the claim has been made that a cure of that dreaded disease is possible, and so frequently our expectations did not realize, that at the present time we accept the new methods proposed with great reserve. Regarding Dr. Gibson's claim, that it is possible to check and cure a tubercular infection by a combined treatment of X-Ray, static electricity added to the ordinary phthisiotherapy seems not without foundation; however, a great number of casuistic and experimental contributions will be required before we admit such contentions more generally.

As in the history of medicine every discovery is linked to preceding findings, so

in the treatment of tuberculosis we notice the gradual steps in the development of our therapeutic understanding. I would only allude to the use of sunlight as a means of treatment of surgical tuberculosis. In the course of the past years the therapeutic use of the X-Ray in surgical and pulmonary tuberculosis was favorably reported on in different scientific meetings in this country and abroad. Also favorable was the opinion of the high frequency current, of radiotherapy in general applied to such morbid conditions.

On previous occasions I had the pleasure to present to the members of this society some new facts on radiotherapy with mesothorium, some data on the treatment of heart diseases by ultra-violet energy; today I would like to report a few casuistic observations made on patients with pulmonary involvement who received a few treatments of radiant energy. The remarkable and rapid improvement that was noticeable after the application of this treatment is of interest and this is the main reason for the present communication.

*Case I.*—Miss L. F., McKeesport, Pa., 36 years old, observed since July 7, 1911. *Family history.* Parents, one sister and one brother living and well. One brother died of consumption at age of 28.

Patient has been suffering from catarrh of the lungs for the past two years, at which time hemorrhage, pains between the shoulder blades, rise of temperature, moderate amount of sputum was observed. The

<sup>1</sup> Read before the Baltimore City Medical Society, Nov. 5th, 1915.

physical examination at that time revealed involvement of both apices extending to level of 2nd intercostal space and middle of scapula to the right side with bronchio tubular breathing, pectoriloquy, numerous crepitant and moist rales over the affected area, whilst on the left side in front the involvement extended as far as the first intercostal space in front, upper third of scapula, associated with harsh breathing, many crepitant rales and bronchophony; over both bases a few moist rales are noticed.

Patient at first presented a moderate elevation of temperature in the evening and was started on tuberculin treatment (.003 O T) which medication was followed by considerable improvement. In April 1912 pleurisy developed, involving the left basis up to the 2nd intercostal space in front, to 7th spinous process in back, with considerable moisture over both apices and infiltration over the same areas. About 2 pints of a serous fibrinous fluid was taken from the left pleural cavity after which the patient seemed to improve materially. From 1912-1914 patient kept doing very well.

In February 1915 she had a cold which did not seem to subside associated with a very hard, hacking cough. Considerable pain in the right side, general tiredness, particularly in the afternoon, but apparently no rise in temperature. Her weight dropped from 123-114 lbs.

Patient, anxious about her condition, went for consultation to her former lung specialist, who found considerable involvement and activity over both lungs rendering improvement very doubtful. He suggested a rest cure and fresh air treatment for a number of months, which advice frightened the patient considerably. When patient was seen in consultation in April 1915 the following findings were obtained.

Considerable retraction of both apices, widening of first and second intercostal spaces, infiltration over the right apex extended to 2nd intercostal space in front and upper third of right scapula with increased vocal fremitus, tubular breathing throughout said area, numerous moist and mucous rales. Over the right basis downwards from 7th spinous process the percussion sound is impaired becoming gradually absolutely dull, dimin-

ished respiratory sounds, abundant moist, coarse, rattling, mucous rales with friction rub over the right basis. On the left side, in front, the involvement extended as far as the 2nd intercostal space, impaired percussion involving the left apex, with tubular breathing, extensive moist rales and bronchophony over said area. In the back the infiltration, tubular breathing, abundant mucous and moist rales with bronchophony extended to the upper 3rd of the left scapula, whilst over the left basis the percussion sound was somewhat obscured, the respiratory sounds were distant, but no mucous rales could be noticed. Occasionally the patient's temperature rose in the evening to 99 4-5, pulse accelerated to 96, 122 systolic, 82 diastolic blood pressure.

The heart examination revealed besides a murmurish first sound over the mitralis and aortic region, accentuation of the 2nd pulmonic sound, rather limited cardiac dullness on account of the vicarious pulmonary emphysema of the bases.

Under such circumstances a trial was made with the ultra-violet energy alternating every other day, lasting from 4-5 minutes with maximum intensity of the primary current 10-11 M. A. No particular discomfort was noticed by this treatment. From day to day the pulmonary findings were controlled, so after 5 treatments the following physical changes were obtained.

Percussion sound over the right apex appears considerably clearer, more resonant in front and slightly impaired over the right supra clavicular fossa; expiration is harsh but not tubular, a few moist rales are noticed but no bronchophony as on first examination. Posteriorly over the right apex respiration almost normal, slightly harsh, instead of the many crepitant rales only a few can be noticed, no bronchophony as on former examination. Over the right basis instead of dullness, percussion sound appears normal, respiration more distinct, only a few crepitant rales noticed after cough.

Over the left side in front harsh breathing, over the apex a few crepitant rales in the first intercostal space, a few moist rales over the left supraclavicular fossa, a few crepitant rales over the left basis, but no abnormal percussion note can be elicited over said area by ordinary and palpitory

percussion. Subjectively the patient is considerably improved and is advised to report to her home physician.

In this instance the patient reports regularly about her condition which has maintained itself, and also, according to the physician in charge of the case, there are no signs of a relapse. Briefly reviewed, this patient benefited under the physical treatment, namely, we find a reduction in the extent of the areas of impaired percussion sound, even the disappearance of abnormal percussory signs, the change of tubular into harsh breathing, a reduction in the extent of moist and crepitant rales and absence of bronchophony.

If in this case a marked improvement could be noticed in 10 days interval, should such a change be noticeable in an ordinary tubercular case without any special medication? Such a possibility cannot be absolutely discarded although it must belong to the exceptions. In this particular case I am inclined to ascribe at least part of the rapid improvement to the action of the radiant energy.

*Case II.*—D. Ward G, porch 3, white, male, aged 50, single, tailor. Chief complaint—cough, could not get his breath, pain in side. *Family history* absolutely negative. Parents dead of old age, 3 brothers living and well; had no sisters.

*Past history.* Patient came to this country 20 years ago from Russia. Does not remember any previous diseases; has been sick for the first time with present illness. Since 3 months complains of cough, shortness of breath, general weakness, intense pain in left side. Cough was productive, followed by expectoration of white tenacious sputum; no blood. Had night sweats; no loss in weight.

Cardiac vascular disturbances are negative with the exception of shortness of breath; edema of ankles, of face or other parts of the body are absent. About 3 weeks ago was treated at another institution for pneumonia and discharged as cured. He immediately afterwards entered this institution complaining about the same symptoms as in his previous illness.

No urinary symptoms.

Alimentary tract—functions normal.

Habits normal, consumes 3 cups of coffee a day; not addicted to alcohol nor any other stimulants or drugs.

*Physical examination.* Patient fairly well developed, fairly well nourished. Examination of head does not give anything abnormal except slight anemia of the conjunctiva, poor preservation of teeth, congestion of the pharynx and moderate enlargement of tonsils. Palpable cervicel glands, marked pulsation of the carotids, no enlarged thyroid gland.

The physical examination by the intern on service reveals at entrance the following facts:

Fairly well developed thorax, depression of supra and intraclavicular fossae on either side, impaired percussion sound as far as 3rd intercostal space to the right in front, numerous moist rales extending from both apices down to bases. Impaired percussion sound over both apices in back as far as middle of scapula on either side.

At a later examination by myself the following additions to the previous statement were made.

On 2/23—Depression of both supra and intraclavicular fossae, impaired percussion sound in front as far as 3rd intercostal space on the right side, harsh breathing, numerous moist rales and bronchophony. Posteriorly, besides tubular breathing over right middle lobe, harsh breathing over right apex, the entire lung seems to be filled with innumerable moist and mucous rales; bronchophony obtained over the right middle lobe. On the left side the percussion sound in front is impaired as far as the first intercostal space with harsh breathing, numerous moist crepitant rales. Posteriorly harsh breathing prevails over the upper part of the left lung upwards from the middle of the scapula, whilst over the left basis the percussion sound is dull with distant, indistinct breathing, absence of vocal fremitus.

The examination of the heart does not reveal anything particular, except that the heart sounds are very distant and indistinctly perceptible.

Examination of the abdomen, of the genitals and extremities is negative.

The temperature at time of entrance to the hospital fluctuated between 96 $\frac{1}{2}$  and 102 $\frac{1}{2}$  in 24 hrs., very intermittent, septic in character, also pulse is subject to similar variations, varying between 64 and 104, the former figure being obtained in the morn-

ing, the latter in the afternoon. Respiration 25, occasionally rising to 40 per minute.

*Laboratory findings.* Urine—trace of albumen, sediment negative, specific gravity 1026, urea 5 gr. pro day, total amount 400 cc.

Blood—Hgb. 85%

Leucocytes 14,000

Polymorphonuclear 80%

Small mononuclear 18

Large mononuclear 2

Blood pressure—Systolic 133

Diastolic 60

3/14—Systolic 128

Diastolic 68

3/13—sputum mucoid, amount 1 oz., yellowish white at first; no tubercle bacilli, however, the next day tubercle bacilli were encountered.

4/23 and 24—the sputum is mucous in character, contains a great many staphylococci but no more tubercle bacilli.

The medication consisted at first of Brown's mixture 1 dr. every 4 hrs., turpentine stupes in the back, inhalation b. d. of compound tincture of benzoin and opium 20 min. each for 15 minutes. Soft diet. The temperature remained septic, very intermittent for the following 7 weeks. Up to March 29th hardly any improvement could be noticed.

An attempt was made with the application of radioactive energy for 2 minutes and 11 M. A.; this was followed by a slight decrease in the maximum temperature for the next 2 days; instead of 101 $\frac{1}{2}$  the maximum amounted to 100 $\frac{1}{2}$  and 100 $\frac{1}{2}$  respectively.

On physical examination less moisture seemed to exist, no rales were noticed, only on the right suprascapular fossa a few crepitant rales could be noticed as well as over the right basis. Over the left apex the respiration was harsh, but no dullness, no rales were noticed, in other words, from the 8th spinous process the respiration appeared more distinct without any rales.

During the next 10 days, when no radioactive treatment was given, the temperature presented again the septic character with maximum fluctuations from 3-4° in 24 hrs., irregular and accelerated pulse, frequency of respiration, amounting to 44 per minute.

On April 13th the electric treatment was again applied and instead of a maximum of 101° at noon, the maximum temperature

in the evening did not rise higher than 99 $\frac{1}{2}$ . The patient felt much more comfortable. For the following 4 days the temperature again became febrile whilst no treatment at all was given until the 17th when 11 M. A. were applied for 2 minutes to one side of the chest. On the 21st the physical examination showed over the right side impaired percussion sound as far as 2nd intercostal space in front, harsh breathing, mucous rales and bronchophony, numerous moist rales over the right basis posteriorly. On the left side similar changes to a lesser extent were observed over the left apex, whilst the left basis showed a better transmitted percussion sound and more distinct breathing, but no rales. The temperature did not show as extensive fluctuations and septic character as before.

On the 26th another treatment was given for the same length and intensity, which for the first 48 hours seemed to favor a reduction in the febrile temperature. Less moisture was found over both lungs, and the impaired percussion note had also cleared up over the left basis posteriorly, with better marked respiratory sounds over the same area.

On May 5th the examination before the discharge of the patient from the institution was as follows:

Retraction of both apices, impaired percussion sound on the left side in front extends to lower border of 2nd rib. Below the 4th intercostal space there exists slightly reduced percussion. Bronchial breathing over the left apex, a few moist rales, pectoriloquy upwards from 2nd intercostal space in the left side. The right apex is hyperresonant with direct percussion, harsh breath sounds, numerous sonorous rales at the basis; over the right apex in front, upwards from 2nd intercostal space bronchophony beginning at 2nd intercostal space on the right side. Posteriorly impaired percussion begins over the left side at the level of the 9th dorsal process with strong percussion, with slight percussion a change occurs at the level of the 8th spinous process. On the right side upwards from 1st dorsal process impaired percussion, over the right basis the sounds are clear, absence of rales over the same area, only a few rales upwards from 2nd spinous process to the right.

On the left basis posteriorly over the dull area breath sounds are distant but still per-

ceptible, very few rales, numerous coarse gurgling rales at the level and inside of the scapula. Above 2nd dorsal to the right very few, distant dry rales. Pectoriloquy over the left apex. Kypho-scoliotic deformity of the back with backward rotation of the right chest.

The heart, which at a previous examination had presented the following diameters on (3/1/15) : 4 in. to the left from midsternal line, 1½ in. to the right of midsternal line, 4 in. in height, 6½ in. oblique diameter, when examined before the dismissal of the patient, the apex was found to be 4¾ in. outside of midsternal line, transverse diameter 4¾ in., height 3 in., oblique diameter 5½ in. Relative dullness begins at midsternal line, absolute cardiac dullness is found at ¼ in. from the left sternal border; relative dullness reaches the lower border of the 3rd rib, absolute dullness beginning with the 4th rib. Roughening of the first mitral sound, accentuation of the 2nd pulmonic, visible pulsation of the cardiac impulse in the 5th intercostal space remains to be noted.

Subjectively the patient felt very well, considerably improved, although, notwithstanding his still febrile temperature, he insisted on going home.

A short review of this patient's physical findings gives the following interesting points :

While under the ordinary treatment hardly any improvement could be noticed. After 3 radiotherapeutic applications the zone of impaired percussion sound became smaller, even hyperresonant, the breath sounds were more distinct and less moisture could be observed. The tubercle bacilli in the sputum had disappeared. There was also found a transitory decrease of the febrile temperature following the electric treatment.

*Case III.*—I. W. 29 years old, laborer, admitted 3/10/15, discharged 4/12/15.

Diagnosis—serous pleurisy.

From the patient's history the following notes are important.

Since February 28/15 the patient noticed severe pains in his left shoulder which gradually extended over his heart, slight chilliness and hacking cough for the past few years. No tuberculosis noticed in his relatives. Patient has been suffering from night sweats for the past 12 years; occasionally he spits some blood. Digestive organs

are normal. Patient had an abdominal operation in 1914.

*Physical examination.* The following can be noted :

Patient of medium size, poorly nourished, emaciated. Slight anemia of the conjunctiva. Congestion of the throat, pyorrhea, palpable cervical glands, thyroid not enlarged.

Chest—lack of respiratory expansion over the left side, absence of vibratory fremitus over the left basis with dull percussion below the left scapula and 3rd intercostal space in front. Harsh respiratory sounds over left apex, a few moist rales. Over left basis respiratory sounds are absent and fluid is suspected in the left pleural sinus.

Heart not displaced nor enlarged; accentuation of 2nd pulmonic and 2nd aortic sounds; slight roughening of first mitral sound but no murmur.

Abdominal findings negative except scar along left rectus muscle owing to former operation. Genitalia, extremities and reflexes normal.

Patient's temperature on admission fluctuated between 100% and 102. For the first 10 days the temperature was irregular with daily fluctuations of 2-2½° in 24 hours with a gradual tendency to sub-febrile temperatures.

Pulse accelerated, 125 on entrance, remained irregular, easily compressible during his entire stay in the hospital.

Respiration on entrance was 22, only occasionally 30 per minute.

*Laboratory findings.* Urine—specific gravity 1031, medium ring of albumen, no casts, 8.8 gr. urea with 400 cc in 24 hours amount. Wassermann test negative.

Blood—Leucocytes 10,420, polymorphonuclears 65%, small mononuclears 32, large mononuclears 2, Hgb. 85.

Sputum thick, tenacious, of dark color without any blood, contains white yellowish, cheesy particles, but no tubercle bacilli can be found.

On March 23rd 1 cc of amber colored serous fluid is withdrawn from the left chest. No further tapping is made but the ultraviolet energy is applied to the left chest for 5 minutes; maximum intensity 10-11 M. A. Following the application the temperature does not exceed 100%, shows a gradual tendency to become more normal, especially after another similar treatment had been applied one week later. Patient seemed con-

siderably improved particularly with regard to the pains in his left side.

The physical examination made at the moment of his discharge from the hospital on April 10th gives the following facts:

A symmetric retraction of the lower part of the left thorax, diminished percussion sound but no absolute dullness below the 7th spinous process. Percussion sound between mid and posterior axillary line on the left side is normal. Left apex posteriorly harsh breath sounds, numerous crepitant rales, slight bronchophony, over the left basis breath sounds are indistinct and distant but not to the same extent as on former examinations; no rales; no bronchophony.

Slight change of the percussion noted upwards from the first dorsal process and first intercostal space over both apices. Over the right apex retraction, dilated capillaries of the skin, harsh breath sounds, numerous crepitant and moist rales and bronchophony are noted. Over the right basis posteriorly breath sounds are exaggerated and numerous moist rales are noted, whilst in front nothing abnormal was found on auscultation.

Visible pulsation of the heart in 5th intercostal space. Relative cardiac dullness begins slightly outside from right sternal border, absolute dullness begins on the left sternal border extending 4 in. from the mid-sternal line. First mitral sound is split and roughened, accentuation of the 2nd pulmonic sound but no distinct murmurs are noticed.

The patient received for the first few days Brown's mixture 1 dr. every 4 hours, castor oil and compound jalap powder for the regulation of his bowels, once .003 gr. of O. T. were given, which was followed by no general reactions.

Patient states that after the treatment of his chest with the ultra-violet radiation the stabbing pains diminished rapidly and have entirely disappeared. No more pains are noticed in his left shoulder and in his legs, the appetite is good, general strength improved, sputum is lessened, practically no subjective complaints are mentioned.

With only a few cases at hand I do not desire to enter into a discussion of the later results, all that I would say is, that in this

particular instance the immediate improvement was striking.

Objectively we state that there was a decided improvement noted concerning the physical findings of the left chest where the percussion sound and the respiration became more normal. In such an instance the question arises, did the patient improve owing to the new means of treatment and would he have recovered as rapidly by the old methods of treatment? The answer to this must remain undecided as no more cases are at hand for comparison.<sup>1</sup> Personally it seems, that the physical changes took place more rapidly than expected under ordinary circumstances; the rapid relief of the pain for which no internal or other medication was used, also speak favorably for the radioactive treatment.

What takes place in the apparatus used, what is the form of energy that is supposed to originate and pass through the diseased part of the body? As already stated on former occasions the electric high frequency current is transformed into ultra-violet rays which can be demonstrated by means of the fontactoscope and by the photographic plate. The resulting energy in the form of alpha, beta and gamma rays is set free and sent to the other electrode by traversing the human body.

As personal experiments have led to the possibility to attenuate and kill ordinary bacteria, virulent staphylococci and typhoid bacilli by the exposure to these chemical rays, should it not be possible to check the growth of tubercle bacilli in cultures in the human body? Experiments along this line will be carried out and reported on at a

<sup>1</sup> Since March, 1915, the same ultra-violet treatment was administered to several other cases of pulmonary tuberculosis. The results so far obtained are very satisfactory and will be reported later.

later date. Without entering into these details at the present time, supposed that such an inhibitory influence of the ultra-violet rays can be accepted, an explanation of the therapeutic effect of the treatment applied cannot be offered as yet.

Of course in the treatment of pulmonary affections and in particular of tuberculosis, one is aware of the insidious course and the numerous sources of error which pertain to the judgment of our therapeutic results; however, further investigation of such an interesting problem seems to be of importance.

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## THE MILK SUPPLY OF NEW YORK CITY—A LESSON IN MUNICIPAL SANITATION.<sup>1</sup>

BY

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"She can milk; look you, a sweet virtue in a maid with clean hands."—*Shakespeare*.

To furnish an adequate supply of pure milk to more than five million mouths is a task as difficult as it is interesting. The problem of New York City's milk supply presents one of the most important chapters in the complexities of modern urban life.

Far back in the early times, everyone had milk from his own cow. Later, a few received it from their neighbors in exchange for other products. As time progressed and villages and towns became more populated, some people made it their business to supply milk to the others. So far the consumers had more or less personal control of the milk supply, as each family patronized that dairyman, who they were confident would

furnish them with pure milk, or at times they visited his farm to convince themselves of the purity of the product.

However, as towns grew into cities, and cities became larger and larger, and the supply of milk had to be brought from more distant sections, the old intimacy between the producer and the consumer disappeared. A new regime of milk distribution sprung up. New factors had to be reckoned with, namely, the creamery, the railroad and the city distributor.

Civilization, with its accompanying improvements, exacts a penalty for any benefit it confers. While the housewife has been relieved of the responsibility of caring for her own cow, or selecting the dairyman—by having her milk delivered to her door—other drawbacks present themselves, principally in that the milk is often much inferior in grade, though the physical appearance is not changed.

Not so long ago it used to be a common practice to add water to milk, or to take off part of the cream, or even do both at the same time. Furthermore many producers and dealers, in order to prevent the milk from souring, would make liberal use of chemicals such as starch, boric acid, formalin, etc. This practice went from bad to worse, so much so that people soon awakened to these injurious frauds perpetrated upon them, and a clamor arose for milk inspection. Soon the state and municipal authorities inaugurated a form of milk supervision which consisted of a chemical analysis of the milk and the setting of a minimum standard for the water, fat, and solid content.

During many years it became apparent that the infant mortality in the large cities, especially in the congested sections, was appalling, and it dawned upon public spirited

<sup>1</sup>The photos illustrating this article were supplied to Dr. Steckel through the courtesy of the New York City Department of Health.

FIG. 1. Unsanitary cow barn—condemned by N. Y. C. Dept. of Health.

FIG. 2. Modern sanitary dairy barn.

citizens and health authorities, that perhaps this useless loss of life resulted from the unsanitary and impure milk supply. Investigations and experiments were inaugurated and the fact was substantiated that the high percentage of infant mortality was, in a great measure, due to impure and adulterated milk. It was found that in proportion as the milk was filthy and contaminated with millions of bacteria, the diarrheal diseases among infants were increased; furthermore, that such diseases as tuberculosis, typhoid fever, diphtheria, septic sore throat and scarlet fever were disseminated through milk. *It became apparent that, in order to insure a pure milk supply, the supervision must extend from the time the milk leaves the cow until it reaches the consumer.*

This was no small undertaking when you consider that New York City consumes over 2,000,000 quarts of milk daily, produced by about 350,000 cows, scattered on 44,000 farms located in six states, is passed through 11,000 creameries and then shipped to New York, a distance of from 50 to 450 miles (in over 250 special milk cars); requires more than 6,000 wagons to deliver this milk in Greater New York, while there are about 14,000 stores retailing milk. All in all, it requires an army of 200,000 persons to carry out this gigantic task daily.

*Unlike other food supplies, milk is one of the most essential articles of diet, since our very existence depends on it.* In this twentieth century the majority of women cannot—and some do not want to—nurse their own babies, and therefore cow's milk is the only food on which to raise our children in order to perpetuate mankind, at least until some savant creates a substitute for cow's milk. The city baby, living in more confined quarters, with lack of air and sunshine, needs a thousandfold more care than

its country cousin. As milk is practically the infant's only food, especially during the first year of its life, when it consumes close to 500 quarts of milk, the necessity for a pure and wholesome milk supply cannot be emphasized too strongly.

Little does the mother dream that the apparently clean, white bottle of milk, delivered at her door, may harbor millions of filthy germs, which when fed to the baby may cause indigestion and other troubles. Or, what is still worse, that this milk may be contaminated with infectious disease germs, and her baby, instead of thriving when fed with this life-giving fluid, may be taken sick and die. The color of the milk has long acted as a veil for many impurities contained in it. It is far more important to know the condition of the milk from a sanitary and bacteriological standpoint, than to know its chemical composition. *The new science of bacteriology has contributed a great deal toward procuring a pure milk supply.* The number and kind of germs contained in the milk bear a direct relation to the manner and method of its production, handling and age.

Though, for a number of years, public spirited citizens and health boards have advocated stricter regulation of the milk supply, it was not until the general public became possessed with a strong desire for hygiene and sanitation, that the new methods of milk control were put into operation. Now, not alone is the milk examined chemically, but its purity is tested from a sanitary and bacteriological standpoint, and special stress is laid upon its freedom from germs. It took years of hard work to bring about this reform. The fight was a three-sided one—with the farmer, the milk company and the consumer. As difficult as it was to induce the farmer to inaugurate

FIG. 3. Bottling milk—New York City supply.

FIG. 4. New York City Dept. of Health Inspector taking milk samples.

sanitary methods in his diary, it was a harder task to bring about the reform in the transportation and distribution of milk.

The milk would come to the city at a high temperature, in dirty cans with broken covers. The dealer in turn would keep the milk an indefinite period and handle it recklessly while in process of distribution to the stores and homes. In the stores too, it was handled carelessly and exposed to contamination from dust, dirt and flies. The mother who would purchase this milk would keep it uncovered and in a warm temperature and feed the baby in a negligent and slipshod manner. Often when the baby would not consume the entire contents of the nursing bottle, the mother would keep the balance of the milk for the next feeding. All this time the milk would be exposed to contamination from dust and flies.

Tremendous changes have taken place recently in the more adequate provision for pure milk in New York City. Millions of dollars have been spent in the building and equipment of dairy barns, milk houses, creameries, pasteurizing plants and milk cars. The old sign "Keep out, this is private," is a thing of the past. Instead the public is cordially invited to visit and inspect every part of the work connected with the milk industry. With all precautions, it was still found that it is almost impossible to secure milk free from contamination with infectious disease germs, such as tuberculosis, typhoid, diphtheria, scarlet fever, etc., so the New York Department of Health recently ordered that all milk received in New York City must be pasteurized, with the exception of the so-called grade A raw, guaranteed and certified milk. It has been ascertained by noted sanitarians that the pasteurization of milk, that is, heating it to a certain temperature, 145 degrees Fahren-

heit for 30 minutes, will destroy many germs, including those causing infectious diseases.

*The milk which arrives in New York City to-day is practically supervised from the time it leaves the cow until it reaches the consumer.* All cows producing milk for New York City must be examined by a graduate veterinarian and their state of health approved. Board of health inspectors visit the dairy farms and see that the barns are kept in proper and sanitary condition, that the water supplied to the cows and used for washing the milk utensils, is pure, and that the milk is kept covered and at the proper temperature. Both the farmer and his employees must present a clean bill of health. In the event of illness either in the farmer's family or in the herd, the milk may not be sent to the city. The inspection is followed up at the creamery, where the same sanitary precautions are observed. In transit, on its arrival at the city depots, at the pasteurizing and bottling establishments and so on until the milk reaches the house of the consumer, the inspectors keep careful watch. Full control is kept over the product by means of a score card or check system, and by samples of milk taken at each stage of its journey for chemical and bacteriological examination.

There are now three grades of milk sold in the city. Grade A, both raw and pasteurized—for infants. The raw milk must come from cows free from tuberculosis, as shown by a tuberculin diagnostic test, it must conform to strict sanitary methods of production and handling, and must not contain more than a limited number of germs. It is distributed in bottles. Pasteurized milk comes from healthy cows and must be produced under sanitary conditions. The germ content is limited. It is also delivered in

bottles. Grade B—is pasteurized milk for use by adults only. This milk comes from healthy cows and is produced under careful methods, but the germ content may be larger than in Grade A milk. Grade C—is milk which is not produced under as careful methods as the above grades. It must be pasteurized or boiled and only be used for cooking and manufacturing purposes. Aside from these grades there is the so-

In order to ship milk to New York City, the dairyman must have healthy cows, clean barns, pure water supply, clean utensils, milk with clean hands, he must discard any abnormal milk, and he must keep the milk cold until delivered at the creamery. He must not ship the milk if there is an infectious disease at the farm. At the creamery too, the milk must be kept cool until pasteurized and must be bottled under strict

FIG. 5. Model milk store—New York City.

called certified milk which is produced under the most stringent sanitary methods, and must be certified by a medical commission.

It will thus be seen that the milk which is received in New York City to-day is produced under quite different methods from those in vogue a few years ago. The inspection begins on the farm and does not end until the milk reaches the consumer.

sanitary conditions. During transportation on milk trains, the milk must be kept cool and tightly covered. In the city plant, on the wagons, at the stores, sanitary measures must be adhered to, in order to avoid any possible contamination.

*The great chain of this pure milk problem has only one weak link, and that is the consumer. He has as yet not learned that some responsibility devolves upon him in*

this important question. Free instruction as to the proper care and feeding of the baby is given to mothers at the milk stations, maintained by philanthropic agencies and by the Department of Health for the distribution of pure milk to the poor and needy. But this is not sufficient. A more energetic campaign should be inaugurated among housewives, as to the proper care of the milk after it reaches the home. Particularly should the housewife remember the three C's: Clean, Covered, Cool.

The fight for a sanitary milk supply for this city has finally been won. All factors are now harmoniously working together in an effort to supply New York City with the best milk obtainable. In my investigations of this question, I find that in comparison with other large cities, the milk in New York is of a high standard. *As milk is a cheap, a nourishing and a wholesome food, people would do well to use it liberally in their daily diet.*

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## NEWER METHODS OF DIAGNOSIS.

BY

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Under the above caption comparative as it is, I choose to discuss only those methods new in the restrictive sense of the last few years. Discussion of only utile procedures further restricts this paper. Those left it is hoped may be put clearly before you as to their practical value and as to their future value in medicine.

For the sake of comparison I will ask you to recollect pre-laboratory days of medicine. A period wherein careful history, alert special senses, experience and

judgment were the complete tools of the medical man. The summit of achievement, the diagnosis of anatomical lesions based upon complete symptomatology, in turn dependent upon complete morbid change in tissue. This period begun with Æsculapius and closed by Osler finds the latter quoting the former to the effect that "experience is fallacious and judgment difficult." The characterization fits the period.

By contrast:

1. By a mechanical instrument, a dose of atropine was indicated and cured what was supposed to have been long standing heart block.
2. The same instrument discovered in a man with no clinical cardiac symptoms an auricular flutter which was cured by digitalis.
3. A laboratory man by examining a specimen of blood discovered an early nephritis in a man with no clinical symptoms.
4. The blood examination diagnosticated a diabetes with a negative urine.
5. A case of rheumatism examined culturally for organisms showed excess of uric acid, which colchicum cured.
6. A man with a specimen of blood is able to describe the respiration of a distant patient he has never seen.
7. By a response of the skin to an injection can be told whether an infant has or is ever likely to have diphtheria.

These results far from clinical, justify further comment and cause us to look to the laboratory with possibly a prophetic eye.

The advent of the microscope and bacteriology has already given us urine analysis, Widal reaction, Wassermann reaction, blood counts, and blood cultures, hemoglobin estimate, smears and sputum examination. Instruments of precision such as blood pressure apparatus, the various scopes, the X-ray, the stomach pump have come with the new era. Judgment has been passed on these methods. They are men-

tioned here as a yard stick with which to measure their younger brothers now to be discussed.

Those methods that I consider to come strictly under the title of this paper are:

1. Measure of kidney function.
2. Measure of glucose percentage in the blood.
3. Measure of acidosis of the blood.
4. Measure of uric acid content of blood.
5. Electrocardiogram.
6. Measure of cerebrospinal disturbance in the parasyphilides.
7. Refinement of physical methods.
8. The Stick test for diphtheria immunity.

1. Under kidney function MacLean's modification of the Ambard coefficient is an estimate of proportion between blood urea and blood sodium chloride as compared with the same constituents of the urine. Also may be mentioned the phalein elimination test, the nonprotein nitrogen of the blood, the nephritic test meals which are measures of nitrogen and sodium chloride and water excretion in proportion to intake, physical properties of the blood serum such as freezing point, specific gravity and refractive index, corpuscular volume in proportion to total blood volume which is a measure of hydremia. Of these methods the MacLean method is most applicable and covers most of the ground. Except for the phalein test on the ground of being more easily done, and the test meals on the ground of completer information, especially of diagnosing passive cardiac congestions of the kidney, the MacLean test seems best. In part it gives the same information. Therefore specific comment.

The urine voided over a space of .72 minutes is estimated quantitatively for urea and sodium chloride. A specimen of blood taken at the middle of this period is estimated in the same way. The proportions give the information of function. This is relatively easily done. This test may antedate clinical suspicion of impaired kidney function and so injured organs may be protected. It is comparable to the Wassermann reaction in obscure syphilis.

2. Quantitative blood sugar may mean diabetes regardless of a urine negative for sugar.

3. Measure of acidosis is done by the Van Slyke test. It estimates the acidosis indirectly by the carbondioxide content of the blood directly. The theory of the volatile acid carbondioxide being displaced by the stronger relatively non-volatile acids is utilized. Under normal conditions the alkaline elements of the blood combine with a known amount of carbondioxide, a volatile acid. The non-volatile ones such as acetone, lactic acid, will displace the former, therefore, a falling carbondioxide content of the blood gauges an increasing acidosis. This may be estimated directly from the blood as in the Van Slyke test or by the carbondioxide content of the expired alveolar air. The relative value of these two tests from a technical view-point is still to be determined. So far some practical results have been obtained. The subject acidosis has other than practical importance. It has directed the profession toward the chemical problems of medicine. Acidosis is found to be a constant abnormality coincident with a variety of maladies. Our physiology taught us carbondioxide excess caused dyspnea. We know now that it was the acid character of this carbondioxide. Toxic acidosis is present in pneumonia, in exophthalmic goitre, in renal disease. Thomas Lewis has called attention to the fact that cardiacs may be dyspneic with no cyanosis. As cyanosis has generally been regarded as a measure of mechanical dyspnea in cardiacs, there must be other than mechanical cause. Acidosis is present in such conditions. Renal dyspnea cannot be explained on mechanical grounds, indeed this field newly opened up may make us rearrange our conceptions in medicine. Asthma is an example cited by Lewis. The same author is sponsor for the incident above quoted of a worker able to describe respiration of a distant patient by estimating the acidosis of the blood. He sees here also a new phase of medicine neglected of late.

4. Uric acid of the blood estimated quantitatively is now done and obscure lesions may be found thus. I repeat the incident of a case examined culturally for a rheumatic infection. Excess of uric acid was found and successfully treated. Quite a changed picture from that of a profound and serious systemic bacterial invasion otherwise prognosticated!

5. The electrocardiogram has opened a new field of diagnosis, that of heart function. The utilitarian aspect of this instrument has been hinted in an early example. To repeat. A case clinically diagnosed on account of an irregular pulse as heart block was found to have sinus arrhythmia amenable to atropine. Here was a changed viewpoint reflected more radically in the patient's new outlook. The other instance of a case with normal radial and ventricular pulse and no symptoms, by means of the electrocardiogram was found to have an auricle beating at twice the pulse rate. This condition in our new nomenclature is known as auricular flutter. As flutter is very apt to develop into fibrillations, which was known clinically as delirium cordis, one can see the patient's perilous condition when clinically he registered normal. Furthermore digitalis cured this condition. The technique of the instrument is not in the scope of this paper. These considerations, I take it, are. A new cardiac conception is arising. Exact localization of anatomical damage is occurring. Cardiac irregularity of function in humans is exactly imitated on animals by injury done to an always characteristic area. By way of further contrast of old and new, delirium cordis with concomitant irregular pulse is not a result of dilated heart per se but a case of auricular fibrillation causing the irregular pulse and dilating the heart by whipping it to excessive effort. The instrument is not new but its effects are changing our present conception of cardiac disease. It gives us an accurate index of heart impulse mechanism. It localizes the disturbances as that of either right or left heart. It gives an accurate indication for treatment. Those who pretend a special knowledge of the heart will find it necessary.

6. By analysis of cerebrospinal fluid, an increased cell count indicates infection. Lange's colloidal gold test of protein seems fairly specific for paresis. The latter disease gives a higher percentage of cerebrospinal fluid Wassermanns.

7. Refinement of physical methods may include the X-ray continually improving in efficiency. The general use of the X-ray in lung, heart and abdominal work is continually more dependable. Stereoscopic X-ray plates are particularly good in estimating positions as to depths. Einhorn's di-

rect duodenal content examination seems to include diagnosis of impairment of pancreatic function.

8. The Shick test is in the field of acute infection. Of such work the complement fixation is now being done on pulmonary tuberculosis with results in doubt. Quite another matter is the Shick test of diphtheria immunity. The rationale is that of the tuberculin reaction. The comparison ceases here, for the Shick test promises to have a utile aspect.

The injection of a diphtheria preparation in specific dilution in a normal individual produces a definite reaction in one not immune to diphtheria bacterial invasion. No reaction indicates the presence in the individual of antitoxin and he is therefore protected from diphtheria. Whether this immunity is inherited or acquired is not elucidated. Upon this test is built the plan of isolating and immunizing with toxin-antitoxin those capable of diphtheria. Final opinion is yet to be formed. Its value if sound is obvious. There are already pediatricians, who in the presence of a negative Shick, in a suspected throat feel that antitoxin need not be given.

The enumeration of the above newer methods, includes nothing of technique; for which one must turn to the pathologist. As to their individual importance, we find we have a gauge of kidney function, of blood sugar, of blood acidosis, of blood uric acid, of heart impulse, of cord pathology, of liability of diphtheria infection.

Most of these methods are in the realm of chronic disease; disorders of metabolism. Conditions as little understood today from the etiological view-point as a century ago. Our present attitude is that of a mechanic getting as much work out of a poor machine as possible. The replacing of new parts is impossible. The cause of the trouble is unknown. These methods are just those referring to the management of cases. In

addition and herein their great value, prompter recognition of disorders of metabolism.

Early in the paper I referred to the old methods of diagnosis. That based on complete anatomical lesions unaided by laboratory investigation. The picture, pallor, some emaciation, headaches, disturbances of vision, polyuria, nocturnal urination led even the ever conservative physician (necessarily conservative because of chances of error) to diagnose a contracted kidney. A complete picture was necessary. The damage necessary to produce all the symptoms is the extent needed to all but terminate life. Prior to this complete picture the clinician probably instituted metabolic management. He probably limited nitrogen intake, protected the skin and produced elimination. If so, his results were conjectural. He probably overdid or underdid the treatment. It is probable that his over treatment hastened asthenia and malnutrition, or as grave an error was made in the opposite direction. By newer methods accurate scientific management and measurement of function of the kidney could prevent such errors.

But chiefly the value is to be found in that legion of cases that older methods call normal, neurasthenic or neurotic. Such cases tested functionally for disorders of metabolism may reveal beginning chronic disease which can be so managed and conserved that the salvage is considerable. Important, in the realm of preventive medicine! Similarly blood sugar and blood acidosis may institute management of these conditions long before hopeless terminal events. The item of earlier treatment justifies these laboratory procedures over clinical diagnosis. The improved function of a diseased tissue after rest may be applied here.

The title of newer methods of diagnosis.

if restricted to simply those of technical laboratory contributions above discussed, might better have been left with a laboratory man. Having come to me for discussion it is inferred that comment from a clinical standpoint is permissible. Economically our profession exists as a matter of community service. In a larger social sense anything contributory to medicine has a discussion aspect. Consequently I conceived my paper to include editorial as well as scientific aspects.

That laboratory and experimental medicine is of great present value needs no comment. The umbral realm of conjectural medicine is being pierced by the light of exact provable facts. Our professional Utopia is complete measurable scientific medicine. This magnificent ideal may not be so remote. Its contributions branching rapidly make for greater complexity. It is a special subject in itself. It is a part of this age of specialization. It calls for a technique quite other than clinical. This raises the present question of the medical man's specialization. Will it be laboratory or clinical? Is the clinician to go? The answer is economic. Will the community be best served so? Possibly, in the future. For the present medicine is still an art. The spectacle of experimentalists posing as practitioners in our schools and institutions is reflected in our present day medical graduates facile of experiment and blind at the bedside. The community is not served best so. Not yet. Not till all medicine is scientific and the community in turn reeducated. Cost in money, time or discomfort at the present excludes complete scientific medicine. Pending such time the experimental mind must be most encouraged to continue solving our problems. He is our future. Yet coincidentally clinicians must be developed as in the past. A

procedure neglected of late just in proportion to our gains on the laboratory side. His present practical need is great. It is an economic one. A community pays well for time saving devices. It most needs a wise selector of cases for special management. Technique here means economic saving. The clinician it would seem is to remain. The true experimentalist calls loudest for him.

Are medical problems reflecting industry? And is medicine about to become corporate as opposed to the individual? Is the doctor of the future to be executive and administrative with his specialist in his employ, his surgeon, his laboratory man, his radiographer? Or is he to become the agent of an administrative governmental instrument? Must complex modern medicine readjust as strikingly as modern industrialism? Is communistic medical control here? Any newer methods increasing the perplexity of the individual and the complexity of his profession, seem weights pulling the balance already tottering in that direction. Newer methods of diagnosis have come till no man can claim but limited special knowledge. New information but hastens the arrival of the Captain of medicine; an executive, a genius of organization. His task is large, that of directing the medical individual to best serve the community. He will rise from the ranks of the clinician. Only there can he acquire the art to fit scientific medicine to the community.

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## MODERN ADVANCES IN THERAPEUSIS.

BY

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It is obviously impossible in the short time at my disposal to give a complete account of all recent therapeutic advances. I shall have to content myself with a very brief resume of the newer contributions that impress me as being worth while and with a short discussion of methods of extraordinary importance.

I shall begin with the mention of certain new drugs. The first is palladium hydroxide in obesity. This was first suggested by von Vogt about a year and a half ago. He and his collaborators are the only ones who have published papers on the subject. Like all other reduction cures, strenuous dieting and vigorous exercise are used as adjuncts. Their best results were obtained in those cases where a familial tendency was present. A few cases have been treated here, with only fair results. The drug is marketed under the name of leptynol. Coal-tar benzene is one of the much-vaunted cures for the leukemias—particularly the lymphatic type. There is no doubt that a reduction in the number of white cells takes place, after a preliminary rise. An improvement in the patient's general condition accompanies the changed blood picture. After that, there may be a free interval, a recurrence or a fulminating type of relapse with death in 10-14 days. All that can be said in favor of benzene is that it is capable of inducing a free interval in the course of leukemia.

Sodium nucleinate is not as new a preparation as the previously mentioned drugs. It was first used by the French as a routine treatment in all types of arteriosclerosis. Results were disappointing and the drug fell

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**Stubborn Constipation in Infants.—**  
This condition is sometimes relieved by the administration of olive oil, given regularly twice a day. In some cases it may be necessary to add to this a few drops (up to four) of fluid extract of cascara.—*Life and Health.*

in disuse. Later its use was revived and the drug used less empirically. It was found that the best results obtained were in those cases of cerebral arteriosclerosis of syphilitic origin, in which the Wassermann reaction of blood and cerebral fluid were negative—that is in cases where all the improvement to be hoped for from anti-syphilitic treatment had already been obtained. I have had one such case under my treatment for the last four years. The patient has an early senile dementia with occasional apoplectiform attacks. The effects of the drug are so certain that the patient's family remarks, whenever the patient proves a bit unmanageable "it is time father had another dose."

Crotalin, as used in epilepsy, need only to be mentioned to be condemned. Fibrolysin and coagulose should also be mentioned in passing.

In addition to these new drugs, certain old drugs have been applied to new usages. Thyroid extract is being used by some in dementia praecox with encouraging but not permanent results. Thyroid extract has also been recommended in the treatment of nephritis. Not many have followed up Percy's treatment, but all reports are favorable—in spite of the fact that the theory on which it is based is none too sound.

Emetin in the treatment of pyorrhea alveolaris is well worth mentioning. It was used in this condition soon after the regular presence of endemeba in pyorrheal pus was demonstrated. There is no doubt that under the use of emetin the emeba disappear, and that coincident with their disappearance, there is an improvement in the pyorrheal condition. On the other hand emetin alone is not able to effect a cure. The most thorough scraping of the roots of the affected teeth and the obliteration of pus pockets is neces-

sary in addition. I may also state that this same thorough scraping if persisted in is capable of effecting a cure without emetin, even in cases in which emeba have been demonstrated. There is no doubt however that emetin helps.

Salvarsan cannot be called a new drug. Its intraspinous administration however is well worth a few words. This method was introduced in 1912 by Swift and Ellis. The original technique consisted in the use of serum obtained from blood withdrawn from the patient about three-quarters of an hour after an intravenous salvarsan injection. Serum thus obtained was diluted—approximately one-half, and then a definite number of cc. of this diluted serum was allowed to run into the spinal canal and take the place of the same number of cc. of spinal fluid, that had previously been allowed to run off. Since 1912, there have been innumerable modifications. Chief among them have been the use of salvarsan solutions instead of salvarsanized serum, the substitution of normal serum plus salvarsan for salvarsanized serum and the introduction of a lapse of 2-3 days from the time of the salvarsan injection to the time of withdrawal of blood for the serum. The use of neosalvarsan instead of the old salvarsan can hardly be called a modification. This idea of Swift and Ellis' is certainly ingenious and fascinating. On theoretical grounds however, it is difficult to see where any great advantage is possible over the old intravenous method. Indeed, it is difficult to see how the new method can even be as good. Granting that there is some value in the method, benefits obtained must come either from the medication injected into the spinal fluid or from antibodies formed by the medication. The amount of salvarsan injected has varied with different workers from one

milligram to one centigram per dose. When salvarsanized serum is used, the individual dose of salvarsan to reach the cord is approximately one decimilligram. Either dose is eliminated by the spinal plexi in about two hours. The same statements hold true in the case of serum obtained after a preliminary wait of 2-3 days. Also, it should be noted that spinal fluid withdrawn 24 hrs. after an intravenous injection, contains arsenic in one-sixth to one-fourth the concentration that it exists in the blood.

Lumbar puncture in itself, is comparatively harmless. Symptoms of meningeal irritation may arise and there may be intense headache. When in addition to a puncture, salvarsanized serum is added, serious results may and have occurred. Temporary paralysis of the lower extremities, loss of bladder and rectal control, vomiting, vertigo and headaches are not rarities. In one case, the urinary difficulties were followed by a cystitis with an ascending infection and death. In another case, three weeks after the sixth intraspinal injection, a rapidly fatal Landry's paralysis developed.

The reports concerning salvarsanized serum are many and favorable; those concerning the use of salvarsan solutions alone are very few. The method was first proposed by Ravaut. The unfortunate Los Angeles experience, in which six deaths occurred from its use, probably did much to discourage further investigation. It must be stated however that in the Los Angeles cases, although the real causes of death were never discovered, there were certain possible errors in technique that might have caused the more than unfortunate result, and the Ravaut method was not necessarily at fault.

From the clinical and laboratory points of view, it must be confessed that the results obtained with autosalvarsanized serum

are excellent. Best effects are obtained in cerebrospinal syphilis; then comes tabes, and finally general paralysis. The crux of the matter, as I see it, is the relative values of the intraspinal injection and the intravenous injections that precede it. Also, how much of the reported benefits are due to the lumbar puncture and the withdrawal of fluid accompanying it? If it shall be proven possible to cure nervous syphilis by repeated intraspinal injections of salvarsan solution without a preliminary intravenous injection, in other words, if a milligram intraspinally, is as efficient as 0.60 intravenously, then many cases which because of advanced cardiac, renal or vascular disease are barred from salvarsan medication, will be available for this type of treatment in the presence of syphilis of the nervous system.

Among other new uses of old drugs, should be mentioned sugar in myocarditis and ergot in myocarditis, dilatation of the stomach and atonic conditions in general.

The recent researches of Hess and Epinger on the conditions termed by them "vagotonias" have given new uses to atropine and its physiological opposite, pilocarpine. These conditions, briefly, are certain types of bronchial asthma, spasmodic dysmenorrhea, spastic constipation, gastric hypersecretion, functional heart-block and certain types of extra-systolic arrhythmia, gastric crises and neuralgic pains in general that may be traced to spastic muscle conditions.

Vaccine therapy has proven its worth in many of the infectious diseases, tuberculosis, strepto- and staphylococcus infections, pertussis and typhoid fever. In the latter disease much interesting work has been done. Unfortunately it is difficult to arrive at any definite conclusions, because of the variety of methods that have been used.

Large doses have been given at weekly intervals; minute doses have been given every second or third day. Finally, live bacilli have been added to convalescent blood serum and the product thus obtained injected intravenously. Small numbers of dead bacilli, injected at frequent intervals seem to be without effect. Large doses used late in the course of the disease apparently are equally useless. Large doses, however, given early in the disease, seem to be able to change an apparently severe case to a mild one. The intravenous use of sensitized serum, however, is the one method that promises most. Under its use, many cases, after a slight preliminary rise in temperature, have terminated by crisis. The disadvantage of these intravenous injections lies in the fact that they seem to cause intestinal hemorrhage in some cases.

Serum from convalescent patients has also been used in the treatment of measles and scarlet fever. The results, although not uniform, are encouraging. In this connection, I might mention autoserotherapy in the treatment of psoriasis.

Before leaving the purely medical side of this paper, I should like to mention the use of the duodenal tube for feeding purposes, caloric feeding in general and in typhoid in particular, and the Allen treatment of diabetes.

The Allen treatment is based on long experimental work on animals and by practical experience with diabetic patients. From one point of view, it is little more than an extension of the idea that prompted Van Norden to use green days, and starvation days. Personally, however, I feel that it is a good deal more than that, for it puts the therapy of diabetes on a sound experimental basis, and it has taken the diabetic out of the class

of patients whom we supervise but do not treat.

The experimental grounds for the Allen treatment were recently summarized by Heffron in the *New York State Journal of Medicine*, and I cannot do better than repeat his statements verbatim.

1. Glycosuria could be produced in dogs and cats by removing from seven-eighths to nine-tenths of the pancreas while at the same time leaving the fragment in communication with the pancreatic duct.

2. That the operated animal which had developed glycosuria could be made sugar free and free from acidosis by a complete fast varying from one to several days according to the degree of glycosuria induced and which in turn depended upon the size of the fragment left in situ.

3. That after the fast, the operated animal could be kept sugar free and without acidosis and become active and vigorous, though thin and hungry, on a diet well within its remaining tolerance of food stuffs, and that apparently there was no end to vigorous life under such conditions.

4. That in operated animals kept on a diet which prevented the development of glycosuria and acidosis, the degree of tolerance for carbohydrates and proteids gradually increased so that they could come to assimilate an amount of food which at first had caused the reappearance of glycosuria and acidosis, without the production of such an effect.

5. And, conversely, that an operated animal that had developed glycosuria and by fasting and diet had remained sugar free, if fed in such a way as to cause the constant elimination of a small percentage of sugar, inevitably showed a gradually diminishing tolerance for carbohydrates and proteids and, though first showing an increase in weight, finally died in diabetic coma on a diet which controls, kept under their own powers of tolerance, had gradually come to take without the elimination of any glucose, acetone, or diacetic acid and which remained vigorous though thin.

6. That the post-mortem appearance of the fragment of pancreas showed changes which bore out the clinical observations, viz., the pancreas remnant of animals

in which a greater degree of tolerance had been established and which were killed in vigorous health, showed no degenerative processes whatever; while in those animals which were permitted to die of the diabetes, the pancreas remnant showed typical progressive alterations in the islands of Langerhans "summarized as vacuolation of cytoplasm and loss of granulation, pyknosis of nuclei, loss of cells, and finally disappearance of islands," changes which are practically identical with those sometimes observed in the pancreas of men who have died of diabetes.

Now if this experimental evidence is applicable to humans as well as to dogs and cats, our therapeutic endeavors should follow Allen's which are approximately as follows. Before going further, I should like to state that Allen has recently modified certain parts of his treatment and that the scheme to be described is not identical with any previously published one. The patient is made to fast until his urine is sugar-free and then for 24 hours longer. The total is usually 3-10 days. During this time, the patient is encouraged to be up and about, and to exercise as much as possible. Unless there is a definite indication, no alcohol or alkaline is given. At the end of the fast, feeding is begun with vegetables containing 5-6% COH, 200 grams are given the first day. Should sugar appear, another fast day is inserted, and the same vegetables given, but cooked in three different waters. These are practically COH free and always tolerated. In either case, the amount given is doubled daily until a fair tolerance is obtained. Each appearance of sugar is the sign for an extra fast day. When vegetable tolerance is ample, meat and eggs are added. Fats are added last. In addition patients are tested for any special idiosyncracy they may have. One patient I know, could eat five pounds of potato per day without showing sugar, but could not handle 100 G. bread. Every three

to six months the patient returns for further observation and treatment. It is usually possible to increase the COH allowance with each return visit.

The final result is a strong, lean, sufficiently nourished patient, educated in the treatment of his disease and willing and competent to aid in its treatment.

Leaving the medical side of my subject, and turning to surgery, two or three large things loom up. Recently Torek performed the first successful external esophagoplasty for new growth of the esophagus. Roughly, the technic consisted in constructing a subcutaneous esophagus from the upper portion of the esophagus and a tube constructed from a portion of the stomach. This paper would not be complete without a discussion of Dr. Sharpe's operative treatment of spastic paralyses. His treatment, the decompression operation, is intended for selected cases from the 70% of spastic paralyses due to intracranial hemorrhage. Only those cases showing signs of increased intracranial tension are operated. We all know that the results are good. Probably some of those present can give a more detailed account.

Removal of the thymus has been performed in Graves' disease with good results when the thyroid is also removed. A cure has never followed thymectomy alone. Insomuch as the thymus is enlarged in 90% of all cases of Graves' and insomuch as a thymus death occurs in approximately 5% of cases going to a fatal ending, further investigation along these lines seems warranted.

In addition, I should like to mention, removal of the spleen in pernicious anemia, operations with the aid of the bronchoscope, operative treatment of bronchiectases, pulmonary abscesses and pulmonary tumors,

and the development of an open operation for empyema, rather than the usual incision, with the removal of a section of one or more ribs, and drainage.

There still remains for discussion artificial pneumothorax in tuberculosis, and the uses of radium and the X-ray.

Pneumothorax is being done less and less frequently and that I think is the best criticism of its merit. It is comparatively harmless; it has helped some cases—although many have not been benefitted, and when its indications and contra-indications are better known will possibly be a valuable aid in the treatment of tuberculosis. Some consider an early artificial pneumothorax as necessary as an early appendectomy; others consider it worthless and dangerous.

The printed reports on radium are widely divergent. Turner reports 33 inoperable cases with no improvement. Doderlein reports 12 inoperable cases alive at the end of one year. A few points are agreed upon. All authors agree that radium is of no service in metastases or recurrences and all agree upon its value in X-ray burns and keloids. Weil reports the cure of a parotid tumor, an adeno-cystic epithelioma of 7 years duration with radium. Certain writers mention the fact that recurrences after radium are apt to be particularly malignant, and not at all infrequent. Also, many writers mention the fact that the bladder and rectal mucous membranes are particularly sensitive to radium, and that severe tenesmus has resulted in its application to these parts. Its use in gout and the arthritides has been discarded. All in all radium seems to be a two-edged sword, with many possible advantages and an equal number of disadvantages. Excepting the treatment of X-ray burns, there seems to be nothing that radium can do that cannot be accomplished equally well, and

with less harmful possibilities by other means.

The X-ray has been used in a variety of conditions—secondary anemias have been helped by it—healing has been stimulated in old fractures by its use—chronic eczemas have been cured by it—hyperidrosis of feet and hands have responded to it, and Graves' disease has been relieved by exposure of the thyroid and thymus to its rays. At present it is also being used in the treatment of uterine fibroids. Finally it has been used as a prophylactic after operations for new growths. There can be no doubt of its value in the treatment of hyperidrosis and chronic eczemas. Its use as a prophylactic is at least a step in the right direction. But I do not think its use in the treatment of new growths, or any other condition amenable to surgical treatment, is justified.

I know that I have omitted some new therapeutic procedures, a few intentionally. Most of the drugs and methods advanced have been criticized unfavorably. I very much doubt the survival of *many* of the recent therapeutic advances mentioned tonight—nor do I think this any great disadvantage. Thinking back for a minute of the things mentioned, you will realize that most of them are beyond the possibilities of general usage, and I do not think we can consider anything a general therapeutic advance whose use must remain in the hands of a select few. Any advance to be worth while must be capable of employment by the average practitioner of medicine or surgery. If there has been any recent great therapeutic advance, it consists in the general attitude adopted by the greater part of the medical men of to-day—the attitude that is discarding the empirical and demanding to know the physiological action of any and all methods of treatment.

## THE PREPARATION OF WOMEN FOR MEDICAL MISSION SERV- ICE AND HOW IT SHOULD BE DIFFERENTIATED, IF AT ALL, FROM THAT OF MEN.

BY

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If one were asked to prepare a key to fit a lock the first step would naturally be to examine the lock and then prepare a key to fit it. So, in considering preparation for this branch of Christian service we find it not only like a lock, exceedingly intricate and puzzling and its mysteries by no means yet solved, but the key at present in use inadequate to unlock the situation as it is today; while its changing phases, the profession itself in the making, do not diminish the difficulties in the way of defining a clear-cut plan of preparation. The medical missions woman, as she has been and is, has been debarred from most of the first class institutions for preparation; she has been sent to her field with little or no equipment; she has been perhaps burdened with debt for such preparedness as she has had; single handed she has had to build, organize, equip and manage a hospital of from 30 to 100 beds, to train assistants or (for lack of support from the home base) do without them; she has been besieged with patients from every grade of society, men, women and children; patiently, cheerfully, uncomplainingly she has acted as physician, surgeon, dentist, specialist, pharmacist, head-nurse, bookkeeper, gardener, instructor of assistants, superintendent of the hospital and of repairs, judge in chronic cases of petty larceny, moralizer of her com-

munity, architect, linguist, undertaker, interpreter, sanitary director, spiritual adviser and inspirer, and incidentally keeping up any easy average of 10,000 new cases annually. When furlough time arrives she may have to close the hospital she put her life blood into, while she seeks recruits and recuperation in the homeland by itinerating among the churches and offering opportunities with a large "O" to her colleagues, who are seeking the joy of dollars instead of that of soul uplift, herself hungry to starvation for better preparation for greater service. "What I aspire to be, and was not, comforts me" sang one who knew, and the medical woman that is is not the woman she *aims* to be. She has no time to fight for her rights as a woman nor gesticulate wildly for political or any other power but that power of Christ-like service, than which the world can give no greater.

"How would you prepare yourself if you could turn time backward in its flight?" I take it is the purpose of the topic presented for our consideration. Dr. Hoover has presented as graphically as may be without seeing it the diversity of situation. Professor Arnold has given us the scholar's view of preparation, which cannot be too thorough, and it almost makes the medical missions woman covetous—not bellicose! to have *the bars down*.

The aim of the preparation we are seeking to define may be outlined as follows:

- I. To be professionally efficient.
- II. To conserve the health of the missionary force.
- III. To evaluate the clinical experience to the country and the profession through research.
- IV. To train women as doctors and nurses.

V. To interpret Christianity to a neighborless world after the pattern of the Christ. (Matt. xi: 4, 5).

Efficiency for the medical missions woman is, if anything, of even greater importance than for women at home; because her work is more diversified, her responsibilities are greater being unshared, more technical aid is often not available and mistakes are more significant. Given a young woman in her high school stage, with promise in intellect and character, supplied with an inspiring friend, who provides literature as well as inspiration, such as a genuine Christian doctor, teacher, preacher or even a non-professional might easily become in the community served, and make the imprint on this impressionable life. Walks and talks and experiments in all the wonders of life, physical and spiritual, will create a thirst. With such a young woman in mind we may consider the following outline as covering preparation for effective medical missionary service:

1. A student volunteer convention, preferably, for vision and inspiration, or failing this, a summer conference on the Christian life with its peerless ideals.

2. The modern high school course, with some pre-medical science, may aid in preparing for four years of college, giving as broad a general culture as possible, majoring in biology and chemistry, with the following as electives: literature, at least one modern language, history, logic, sociology, psychology, short course in manual training and bookkeeping, phonetics and music. Every Christian who is "a live wire" must needs spend quiet time alone with the Christ. A scholar said recently, "Given 30 minutes a day spent systematically and concentratedly, and you may master any subject." The medical missions woman will religiously use

this 30 minutes a day, preferably on rising, to the study of the life and work of Jesus Christ, because of her fundamental aim to become an interpreter of that life. The first two years should be devoted in this way in a group as students together, 1 hour weekly, for personal knowledge and character; the second two years, repeated but leading in the teaching for others. Vacations during the college course should be utilized for physical upbuilding in camp and tramp life, also summer sessions at universities, where some special interest may be intensified, a Missions or Christian conference, child and social welfare conferences—some *definite* aim each year. The young woman should aim to form certain specific habits: (1) the scholarly habit; (2) the world-vision habit; (3) the odd minute habit; (4) the win-one habit; (5) the learner's habit; (6) the personal responsibility habit.

3. A master's degree at some university with an international spirit and view point, such as Teachers College, with major in pedagogy, or physiological psychology, or Bible instruction, or physical education.

4. Four years in the best medical institution, with special emphasis on every branch studied and with a mind dominated by "How may I use this knowledge for others?" rather than "How can I squeeze through the examination and get my degree with the least trouble?" During this period (a) continue habits previously formed but intensified, (b) keep in mind "Oh God, I but think Thy thoughts after Thee," as some of the great mysteries of life unfold, (c) study missions, bibliography and annotate, (d) study how the other half lives and try to help in dispensary work, (e) keep a spiritual case book like the medical one, (f) try laboratory methods of testing out the power of prayer and the promises of God. It is

the Christ method—"Do His will and ye shall *know*." Waste no time reverting to older methods.

The church or community might be led to make some profitable investments at thirty, sixty, or one hundred fold interest in the form of loans or scholarships, where needed and wisely safeguard, so that time might be free for full concentration.

5. A minimum of one year's internship in a large general hospital; a second year, when possible, in a hospital on the field learning the language and becoming oriented.

Not all are fitted for the work of the general practitioner or the country doctor, though at present this is the largest occupied field. Others, temperamentally and intellectually prepared for it, will find a boundless, almost unworked, field on mission ground, and should gain practical experience in laboratories for pioneer work. The X-ray, the chemical laboratory and other such work await the properly prepared woman. Problems of sanitation and nutrition, preventive medicine, public welfare and hygiene are untouched problems, and untouched unless women can make a place for the work in the seclusion of the Purdah.

Perhaps the largest opportunity, almost unlimited in its outreach and practically an unworked field, awaits the pedagogically inclined medical woman in the training of doctors and nurses. She might add to her preparation courses in administration at one of the live universities, or preparation for translation of text books, or normal training, and thus create confidence in the eternal potential of Christian womanhood. She may have the privilege of helping to train pioneers for the new field of the school doctor, already required in some localities. The school doctor if so greatly needed here is a

thousand fold more needed on the mission fields—if these are ever cleaned up—for surely the people literally perish for want of knowledge and sanitation. In every hospital and dispensary the need of trained workers is painfully evident; every evangelist could multiply her usefulness many fold by having the trained nurse and doctor along with the Bible woman to carry the three-fold gospel of teaching, healing and preaching to the millions of suffering, helpless women who never could get to the large centers, indeed who would choose to suffer and die rather than violate their caste law of seclusion. It was the Christ way—"God's kindergarten method" to those who could not catch the import of the spiritual message while suffering. Such a set of trained women would also provide for the awakening womanhood of the church a new and safe avenue for the expression of service. "Saved for service" may easily become the habit of the women, and the medical missions woman for this broad field seeks the best preparation she can find in post-graduate schools, in study of work already going on in first class institutions, in conference with experienced men and women wherever available.

Pardon a digression to pay a tribute and give an expression of gratitude to the New York Post Graduate School of Medicine. It very consistently (to the professional aims of the physician) opens its doors wide to women as well as men, and generously contributes to the mission cause half rates for medical missionaries. Experience in Vienna as well as here enables observers to testify that this service compares favorably with that of Southern Europe in 1905-6. Returned medical missionaries could not do better than to add to their preparation by

time spent there. All are alike hospitable and courteous to women.

The last and equally important aim of the medical missions is to interpret Christianity in a language that the woman—subordinated world, the unwriting world, the unreading world, the child-married world, the child-widowed, unloved, undesired woman world can understand. Medical missions are not merely a means to an end, but a vital, integral part of the Christ program, and not until the church learns that its message is not to disembodied spirits and the medical profession recognizes more fully that bodies are but instruments of mind and spirit, will the best preparation for human benefaction be accomplished. May we not call medical missions "Applied Christianity," for how better teach in Christless lands the second Commandment, "Love thy neighbor as thyself?" How better meet the lifeless creeds than by presenting the rich fruits of Christianity as exemplified in the practical works of the healing ministry? The Great Physician must have anticipated the ease with which the balance between faith and works may be disturbed when he replied to perplexed John in terms which may well be applied to-day as *tests* of a well rounded Gospel to an unloving, neighborless world. As vital as theory and practice to the physician is this principle of faith and works to the Christian.

The medical missions woman in her aims recognizes the emancipator of her womanhood, the one who first gave her social justice, the one who commanded her to tell the good news of the resurrection to the disciples and who bade her go and do as He had done, and even more, promised she should do "greater things," even the privilege of introducing the incomparable Christ, through delicate, sacrificial ministries, to

the suffering, submerged womanhood of the world, those for whom He—even He—gave His own body that not one of them might "thirst" nor miss "the abundant life."

How should preparation be differentiated, if at all, from that of men?

The question of differentiation in *preparation* of men and women seems quite superfluous from the scientific standpoint, for the human body and human relations act and react so constantly that knowledge of each is necessary to complete understanding and ministration. In Thorndike's interesting monograph on "Individuality" we read, "What little scientific study of the differences between the sexes, in intellect and character, there has been, tends to minimize the traditional conception that there are two distinct kinds of beings, never understanding one another and requiring very different kinds of treatment. On the contrary it appears that if the primary sex characters—the instincts directly related to courtship, love, childbearing and nursing—are left out of account, the average man differs from the average woman far less than many men differ from one another." Traits that were hitherto thought to be radically different are found to overlap in unexpected measure. Hence while we may safely argue that the preparation of the medical man and woman may and should be co-ordinate, the practical application to the radically different social order may be quite another matter. Where the natural differences do exist they are differently interpreted in the Orient, and perhaps at no other point of contact of the East and the West are there wider distinctions made in ideals—the Christian home and the monogamic marriage being but a fact of the whole delicate question. This subject requires a delicacy of handling and deeper study than have yet

been given to it. That innate shrinking from male physicians by all women of the better class finds many a counterpart in the minds and hearts of delicate, sensitive women and men even in the Occident, and whether this be due to religious scruples or to caste laws, or plain unconventionalized instinct, need not now concern us so much as that we make wise discrimination, that we do not shock or offend the finest sensibilities of those we seek to uplift. Since we go to interpret the character of One who bade us not offend one of these little ones, do we not need to study very carefully, for example, the place of the General Hospital and consider if His principle of co-ordination be not in order? May we not seek to see if this instinctive modesty, this shrinking from the examining hand is not truer to nature than that which our own conventions tolerate? May we not find in this protest, even unto death, an Oriental contribution to womanly ideals, and that we need to be learners rather than teachers in this matter of innate privacy? Many an Occidental woman suffers in silent endurance rather than sacrifice her modesty for relief, and thousands upon thousands in the Orient will suffer and die rather than pay that price. Let there be differentiation then, not in preparation so much as in practice where nature herself seems plainly to indicate this difference. Genito-urinary work for man by men, for women by women, in the Occident as well as in the Orient. The medical missions women who have the entree to the Harem and behind the Purdah, who themselves being women can understand woman-kind possibly as well not to say better than men, fail to realize how it can be otherwise at this stage of development. They indeed seriously question whether the Occident

needs devolution or the Orient evolution of this subject.

But after all the preparation and in face of all the Himalayan need, the years have taught us that it is not Kultur nor science nor philosophies nor armies nor navies that elevate mankind, East or West, but "a still small voice within," and the truest fundamental preparation for this, as all the ministries of Christianity, is a growing likeness to that One altogether lovely. "It is not what the best men do," said Phillips Brooks, "but what they are that constitutes the truest benefaction to their fellow men. Even in our own little sphere, it is not the most active people to whom we owe most. It is the *lives* like the stars which simply pour down on us the calm light of their bright and faithful being, up to which we look and out of which we gather the deepest calm and courage." Jesus Christ Himself gives us, men and women alike, the Master Key to service—"and I if I be lifted up will draw all men unto me."

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## THE PRE-MEDICAL AND MEDICAL EDUCATION OF MEDICAL MISSIONARIES.

BY

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From the missionary point of view I appear before you as a layman, who has studied the problems of medical education. What I can say that will help to determine the proper preparation of medical missionaries must be limited essentially to their medical education. If I have little to say about the evangelistic side of the preparation it is not because I under-estimate the

importance of such work, but because I do not feel competent to give advice on this subject. Yet this aspect of the problem cannot be ignored, even in considering the requirements of a proper medical training, for it is evident that medical training alone would not qualify a man to be an efficient medical missionary.

This aspect of the problem is so admirably set forth in the Report of the Committee on Qualifications and Preparation of Medical Missionaries and Nurses, presented at the third annual meeting of the Board of Missionary Preparation, that I venture to quote from that report. "The medical missionary must also be a Christian man and imbued with the missionary spirit. It is not deemed necessary that he should have a theological training or be as fully prepared for evangelistic work as the ordinary missionary. But he should be so much in sympathy with the evangelistic work as fully to appreciate its importance, to hold his own work in proper relation to such effort, and to perform consistently his part in helping to realize the object of all missionary endeavor. It would be a mistake to appoint as medical missionary a doctor who is not prepared in the spirit of Christ to devote himself to the work of his fellow men. It would be an equally great mistake to appoint those with a strong missionary spirit but without the professional qualifications."

Beyond such a general statement perhaps it is not wise to go in an effort to determine the balance that should be required between professional medical attainments and the evangelistic spirit. We may accept the above statement of the committee as a minimum requirement, so to speak, of the missionary spirit. You would welcome greater enthusiasm and better qualifications for evangelistic work, and a desire to share in the

non-medical activities of the mission. A practical question is how far these latter qualifications should be given weight in the selection of medical missionaries as compared with the medical requirements.

Does not the practical answer to this question depend in part upon the field of work? I have talked with ordinary missionaries who have been stationed where there was no physician. They have found it necessary, out of simple humanity, to prescribe simple remedies and to treat injuries. They are practicing medicine in a certain sense. It would seem desirable that all missionaries should receive instruction in what may be called "first-aid" treatment. If such elementary knowledge of medicine is useful, there must be useful place for a good missionary who has a more extensive knowledge of medicine, even though he is a poor doctor. There is, however, a great question whether such a man should be classed as a *medical* missionary. It would seem to be desirable that this term should have a definite meaning as regards medical training, and that it should not be used unless the physician has complied with certain definite requirements. A man who falls below these requirements, although acceptable for a minor post, should not be considered to be in line for promotion to posts of greater responsibility without further medical training.

Whether or not it is practicable to limit the application of the title "medical missionary" to physicians who meet a given standard of preparation, it is desirable that the Missionary Society should have some satisfactory standard in mind, that it should limit appointments as far as possible to those who meet these requirements, and that it should accept as a duty the problem of the further training of men who fall below this

standard before they are placed in positions of medical responsibility. For this reason it is a question how far it is good policy for a Missionary Society to accept physicians whose preparation is below standard, who can have but a limited field of usefulness.

The solution of this problem must depend to some extent on the supply of applicants for such work. If the supply exceeds the demand, it is easy to select the best; if however there are more positions to fill than there are applicants, it may be necessary to utilize the best material available. It must also be recognized that the conditions to be met in the missionary field are so varied that it is practically impossible to draw a sharp line as to the requirements. A man who would not be acceptable for a large station, where the various phases of the work are well differentiated and performance of a high order is demanded, might be acceptable for a small, isolated station.

This problem is not dissimilar to one that presents itself in the licensing of physicians in this country. In the more thickly settled states it is not difficult to establish uniform standards of medical qualifications for licensing physicians. But in other states the standards that are suitable for cities and the thickly settled sections result in more or less hardship for some remote sections that are sparsely settled. The physicians who come up to the standard that is desirable, and that can properly be required for the larger communities, are loth to settle in these undesirable places. Within certain limits at least, it is better that such communities should have less well qualified physicians than that they should have none at all. Yet difficulty would arise in licensing such physicians, because the license, granted by the State, does not limit them to any specific location. In my opinion this prob-

lem has not been settled satisfactorily, yet I do not see a practical solution that is better than the one in vogue, of establishing relatively high standards for licensing physicians to practice in the State.

To a certain extent the appointment of a medical missionary corresponds to the licensing of a physician. Standards must be established, even though they are not applicable to all places and conditions. These standards may be regarded as desirable of application, perhaps, rather than as rigid rules.

Should such standards be the same as those in this country, or higher, or lower? It seems to me that the answer depends in part upon the object of medical work in the mission. We are speaking, of course, of foreign missions, among people who are not Christians and who usually are not civilized. The original incentive to missionary work among such people was the desire to convert them to a belief in Christianity. The saving of men's souls was the main object, and this is still properly the chief aim of missionary endeavor. The physical welfare of the people at first received little if any consideration, yet today, with our broadened conceptions of missionary work, this is a very important feature. While medical work is a valuable aid to successful evangelistic work by the mission, this is not, I believe, the real reason why this work has grown to such importance. I know that the value of medical work from this point of view has been especially emphasized in writings on missionary work, yet I venture to say that the real incentive that has brought about the development of medical work has been a pure spirit of humanity, of love for our fellow beings.

If the main object of medical missionary work is to impress the ignorant, to win their

gratitude, and thus to lead them to a belief in Christianity, then anything that is reasonably above the medical practice among these people might be as effective as the most skilful care. The very fact that the missionary societies aim, as far as possible, to furnish the best available medical care for these unfortunates seems to me a proof that after all it is the spirit of humanity that lies back of the medical missionary work, rather than the evangelistic spirit alone.

On this basis the requirements of medical training for medical missionaries should be at least as high as the standards for this country. Should they be higher? This is a practical question, rather than a theoretical one. It seems to me that there is greater need for a thorough foundation in medical knowledge, and for skill in a broader field of medicine, for the medical missionary than for a physician who practices at home. The reason is that the medical missionary is, or may be, far removed from other members of the profession. He must rely on his own resources, he cannot call specialists in consultation, and he must be able to do creditably anything that may come to him.

When we speak of the standards of medical education in this country, we must remember that the situation is somewhat chaotic. The licensing of physicians is a part of the police power of the various states. There is no power that can compel a uniform standard, and the requirements still vary widely in the several states although progress is being made toward greater uniformity. The requirements of the Council on Medical Education of the American Medical Association, and of the Association of American Medical Colleges, representing as they do the opinion of medical educators as to the proper minimum requirements,

may be taken as the desirable minimum standards for medical missionaries.

The essential features of these requirements are, a four-year high school education; at least one year of work of college grade in physics, chemistry, biology, and French or German; and four years in an acceptable medical school (Class A, of the classification of the American Medical Association).

It is recommended by the council that medical students should take two years of college work, including the pre-medical sciences mentioned above, and at least one year as intern in a good hospital. It would seem wise for missionary societies to place their minimum requirements for medical missionaries as far as possible on this level. The recommendation of two years of college work is based on the opinion that the requirements in the pre-medical sciences ordinarily require something more than one college year if they are to be taught satisfactorily,—and that the broader education gained by the rest of the two years in college is desirable. The desirability of a year in the practical care of the sick, as a hospital intern, before a medical missionary assumes the responsibilities of field work, is too obvious to need argument.

Many advocate a full college course, including the pre-medical sciences, before the medical school is entered. This is desirable, but not essential. The advantages of the broader education are offset, in part at least, by the added age that would thus be required of the graduate in medicine. Perhaps in the missionary field, fully as much as at home, it is desirable to begin work while the individual is still somewhat plastic and adaptable. This question becomes of still greater importance if the medical missionary is also, as has been recommended,

to have some theological training, and some knowledge of psychology, sociology, pedagogy, and many other useful accomplishments. If we required a knowledge of all the subjects that might be useful, the candidate would at least be gray-haired before he would be ready to begin his work.

In this connection I wish to emphasize two important points. The first is the great advance during recent years in placing medicine on a more scientific basis. For this reason a thorough training in the pre-medical sciences (physics, chemistry, and biology) is essential. Not only is the knowledge thus acquired essential for an understanding of the medical studies as taught today, but the training in scientific methods of observation and investigation is of the greatest importance. Anything less than high-grade college courses in these subjects fails to give a really satisfactory foundation for medical study today.

The second point is that during the four years in the medical school the student will have all that he can do to pursue his medical studies satisfactorily. At least during the academic year of eight or nine months he should not attempt to carry on other studies in preparation for missionary work. This could be done only at a sacrifice of thoroughness in medical preparation, for the four medical school years are barely sufficient to teach the fundamental principles of modern medicine and to give a rather limited training in their application. Students in the medical school are really overburdened by the work required of them. This is due to the effort of teachers to keep their instruction abreast of the advances in medicine. There is serious talk of lengthening the medical course to five years, but I think it would be more sensible to keep the course at its present length and to limit the in-

struction during that period to those essentials which all physicians should know. The fifth year could then be spent on more advanced work in special lines.

It seems unnecessary to go into details as to the subjects to be pursued during the medical course, if it is agreed that a medical missionary should be accepted only if he has graduated from a school in Class A. The curricula of required subjects in these schools have been sufficiently standardized so that they do not differ in essential points. They provide a good all-round training in medicine. There are, however, opportunities in most schools for optional or elective courses, and here a choice may be made of subjects that will be useful in missionary work. The extent to which students may take advantage of such opportunities depends on their ability, the thoroughness of their previous preparation, and on their application to work. They should not slight the required subjects for the sake of taking such extra studies, even though these studies have special application in medical missionary work. They should not attempt to specialize in their work during the regular medical course, except by the choice of optional or elective courses.

Another way in which a student may secure preparation in subjects of special importance in medical missionary work is by taking summer courses. The medical school year is modelled after the collegiate year, and there is usually a summer vacation of three or four months. This is longer than is actually necessary. I see no reason why men of the age of medical students should not devote two months of this vacation period to medical study. In fact I feel that the next step in lengthening the medical course should come in lengthening the school year rather than in adding another year or half

year to the course. A large number of students voluntarily take extra work during the summer, and candidates for positions as medical missionaries should especially be urged to do this.

This question of special medical preparation for the field work of a medical missionary is a large and important one. We have taken as a desirable minimum requirement, after a four-year high school course, two years of college work including the pre-medical sciences, four years in a first-class medical school, and one year of practical application as intern in a good hospital—seven years in all. This course of study may reasonably be expected to turn out a well educated general practitioner. But we have seen that the physician who is to undertake medical missionary work should be even better prepared, and I think it advisable that he should take a year of special preparation after his hospital experience.

The subjects which should be studied during this year of work may be determined in part by general considerations, and in part by the field of work if that is known. We may say in general that attention should be paid to those branches which require special technical skill. I would place surgery first, and then diseases of the eye, ear, nose and throat. Obstetrics and diseases of women and children are also of great importance, but are more likely to have been taught with satisfactory thoroughness in the regular course or in hospital experience. Preventive medicine, hygiene and sanitation are subjects of great importance and general application.

Tropical medicine may be taken as the type of those subjects which are determined by the location of the field of work. Neither in the general course of the medical school nor in a hospital in the temperate zone will

sufficient training have been obtained for those who are going into the tropics. But these courses also have a wider usefulness for medical missionaries in general for these men will have to deal with and should be able to investigate diseases which are not found or are rare in civilized communities. The methods of study and investigation in tropical diseases offer a most excellent preparation for such work in any part of the world.

Our candidate has now received a thorough general training in medical and also one year of special medical preparation. If he graduated from the high school at the average age, eighteen years, he has had in addition a minimum of eight years of medical preparation, and he is at least twenty-six years old. It is time he got to work in the field, and we should hesitate to add any additional subjects, medical or otherwise.

It is probably disappointing to some—especially to those who are familiar with the old order of things—to find that so many years must be fully occupied with strictly medical preparation. From a practical standpoint you recognize the advantage of having the medical missionary something of a missionary as well as a physician, and you know that preparation is necessary for missionary work as well as for medical work. Yet we who are studying the problems of medical education cannot see any shorter route to a thorough preparation in medicine as it exists today. It would appear that a further differentiation of the work must occur—at least in the larger missions—and that if you are to have well-equipped physicians, they cannot also be well-trained missionaries. At least this appears to be true if these men are to enter upon their life work while they are still young enough

to be adaptable and energetic enough to be progressive.

It is the rapid progress in our knowledge in medicine that has brought about this situation. And, since this progress will continue, the missionary societies must face the problem of keeping their medical missionaries up to date. It is becoming more and more important that these men in the field should have opportunities from time to time to return to the best medical centres to "brush up" and keep abreast of progress, and also to study special subjects which their experience in their particular field of work has shown to be desirable. With the advances now being made in opportunities for graduate medical study in this country, very satisfactory results may now be obtained by such a plan.

I have two suggestions to make in this connection, based upon my experience in dealing with medical missionaries who have returned for further study. First, I think it desirable that the missionary should be allowed to spend practically all of his time in medical study that is not needed for rest and recuperation. A number have been unable to pursue studies that they felt were important, because of the time allotted to lecturing tours or other activities. Secondly, it hardly seems fair that the missionary, as occurs in some cases, should be expected to bear the expense of this added medical preparation. It seems an expense that ought to be borne, at least in part, by the missionary societies; and I have known of cases where the missionary was unable to take a course that he considered important, because he felt that he could not afford it.

Returning to the question of the preparation of medical missionaries, I wish to emphasize the importance of advising candidates who are beginning their medical edu-

cation to attend the best medical schools. Only in these schools can a really satisfactory medical education be secured. The mere fact that a medical school is placed in Class A is not a sufficient guarantee. This classification by the American Medical Association has been made on a liberal basis. Class A includes not only the best schools, but all that are considered passable for recognition by the state boards of registration in medicine.

Finally I would endorse the recommendation of the Committee on Qualifications and Preparation of Medical Missionaries and Nurses that "every appointment to medical missionary service should be conditioned upon the passage of an examination by an examining board of some state or other authority." It is obviously desirable that a medical missionary should be able to follow his profession at home in case he is incapacitated for work in the missionary field, or is found unsuited for the work.

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## SARCOMA OF THE TONSIL—WITH A REPORT OF A CASE.

BY

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Mrs. D. G. R., age fifty-eight, first came under my observation on October 26, 1913, with the following history: She is a married woman and has seven children living, and while having had no abortions or miscarriages, had the usual diseases of childhood, and always enjoyed good health until about six years ago, when she had typhoid fever. Outside of that illness she has not been sick up to the present time which dates from July 1913, with only a small ulceration on the left tonsil, and complained of slight difficulty on swallowing. Directly after this

she consulted a physician. He used a 10 per cent. solution of nitrate of silver locally upon the ulceration with the result that the swelling and ulceration increased in size. When I first saw her on October 26th, the following conditions were present: She was a woman of heavy build, being five feet seven inches tall, and weighing 205 pounds. Her general appearance was good showing no anemia or cachexia. Externally there were no evidences of disease except a swelling in the region of the left cervical glands, and which was confined mostly to the submaxillary region. The skin was normal in appearance, and the eyes were in good condition. A physical examination of the chest and abdomen showed no functional disorders. There was no swelling or edema of the lower extremities. The blood vessels showed no signs of arteriosclerosis with a blood pressure of 140 and a pulse rate of 74. The pulse was regular, soft and easily compressible. The urine was normal in amount with a specific gravity of 1014 acid. No albumin or sugar. Microscopic examination was negative. Blood examination at this time showed a hemoglobin of 80 per cent. Red cells, 4,600,000, white cells, 8,800 with a differential count showing 70 per cent. polynuclear. Examination of the nose was negative, and the throat showed an enlarged left tonsil the size of a walnut with an ulcer in the center about the size of a ten cent piece. This ulcer was irregular in border and bled upon the slightest touch. The tonsil was freely movable and not adherent at any point. The clinical appearance was that of a sarcoma of the tonsil. A Wassermann examination was made and found to be negative. The luetin reaction was also negative. Externally a bunch of glands could be felt anterior to the sternomastoid, but these were freely movable. This mass was somewhat hard in character and no fluctuation could be made out. The patient was seen by several specialists and also by several prominent surgeons who all agreed that clinically it looked like a sarcoma of the tonsil.

**Treatment.**—During the early part of November the high frequency current was applied daily, both to the tonsil locally, and externally to the glands, but no marked effect took place. In conjunction with this, Coley's serum was used. At first the dose was only 1 minim injected subcutaneously in the gluteal region and the strength gradual-

ly increased until 15 minimis at one injection were given. A severe reaction occurred several times with a marked chill, temperature rising to 104; rapid somewhat irregular pulse ranging from 120 to 160 at times, irregular and in conjunction with this cyanosis and dyspnea. In spite of these heroic measures there was very little response to this treatment. On December 28, 1913, at St. Luke's Hospital, Dr. Abbe used radium. Two quills were inserted in the left tonsil, each containing fifty milligrams of radium bromide, which were tied together and allowed to remain in place for twelve hours. Upon their removal a slight hemorrhage occurred, but this was easily controlled. At the same time one hundred milligrams of radium bromide was applied externally to the glands in order to apply the cross-fire effects of the rays. The immediate effects of the application of the radium were most marked. The tonsil had the appearance of a piece of raw meat, but the glands were not very much affected. On the seventh day the patient complained of a great deal of pain on swallowing. A severe radium burn was present on the tonsil and soft and hard palates. The roof of the mouth, however was chiefly affected. The patient obtained only slight relief, and the difficulty on swallowing and pain increased. On January 26, 1914, at St. Luke's Hospital, Dr. Abbe removed the left tonsil by means of a snare, and the mass was examined microscopically with the report that it was a round-celled sarcoma. Radium bromide, strength of 150 milligrams, was applied externally to the glands for twelve hours, and a hundred milligrams applied to the tonsil stump for an hour. Within a week's time the glands of the neck and axilla rapidly increased in size, and the patient complained of a great deal of pain upon swallowing. The symptoms gradually grew worse, and on April 3, 1914, the glands in the cervical and axillary regions increased in size, and at this time the signs of an early metastasis at the base of the right lung was apparent as evidenced by signs of consolidation, dyspnea, cough, difficulty in breathing and slight expectoration. The pulse at this time was 100 regular, easily compressible, blood pressure 145. On April 8, 1914, there were signs of a thrombus in the left subclavian vein, and there was marked edema of the entire left arm. On April 9th, the patient on account of

the marked dyspnea insisted upon getting out of bed and sat in an arm chair for only a few minutes when she gave a sudden gasp, became very cyanotic and blue and died in a few moments. Evidently a case of pulmonary embolism. No autopsy was permitted. There were several interesting features in regard to the above case, namely: (1) the unusual mobility of the tonsil, (2) marked effects of the first application of radium, (3) the two applications with the removal of the tumor with the consequent rapid recurrence and metastasis.

Sarcoma of the tonsil occurs quite frequently, and the two varieties generally met with are the small round-celled or lymphosarcoma which is very malignant in character, and the second or the spindle-celled sarcoma which is less malignant. The small round-celled variety spreads almost through the lymphatics, through the neighboring glands and may be disseminated through the body by means of the lymphatics. The spindle-celled sarcoma not infrequently becomes encapsulated and may be shelled out of its folds with very little existing evidence of involvement of the neighboring structures.

**Pathology.**—As a rule the spindle-celled growths are dense in character even to the point of assimilating a fibrosarcoma. They are firm in consistency and are less malignant than any other form. The round-celled variety have very little stroma, are highly vascular, and ordinarily are soft and succulent. The growth in the tonsil is usually very rapid.

**Symptoms.**—Discomfort on swallowing is generally the first sign noted, changing later into decided pain. The mechanical interference with the functions of swallowing and speech are early experienced, hemorrhage is not always present, but it usually occurs after ulceration has taken place. Glandular enlargement is always present in the small round-celled variety and usually at an early date, while in spindle-cell sar-

coma glandular enlargement may be deferred until late. Ulceration of the surface occurs in the round-celled variety, giving rise to a fetid discharge and markedly increased salivation.

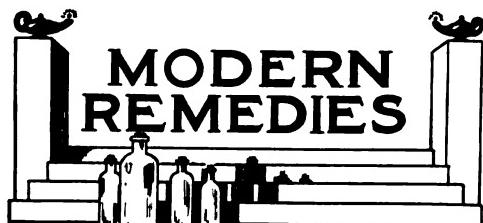
**Diagnosis.**—In its incipiency sarcoma is to be differentiated from quinsy, syphilis and epithelioma. From quinsy the element of time will decide the question. From syphilis it is by no means easy, for at certain stages of the progress in each there is much similarity and skilled diagnosticians have been led into error. Wassermann and luetin reactions should always be made and when in doubt it is well to give the patient a thorough antisiphilitic treatment. At times it is difficult to diagnose a sarcoma from epithelioma. The latter is warty, irregular in outline with no demarcation and the excretions are pallid. Ulceration is more rapid in epithelioma and cachexia occurs early. The lymphatics are also involved earlier. The tendency of epithelioma is to involve the tongue and soft palate. In difficult cases the microscope is frequently the only way of determining the exact nature of the growth.

**Prognosis.**—Death results usually in from three to fifteen months.

**Treatment.**—If the case is seen early enough, before there is much glandular involvement, a radical operation in the form of total extirpation of the tumor and glands is to be advised. It is the only method that will give satisfactory results. The early use of Coley's fluid in these cases has shown it to be of no value. The hard X-ray with the use of the Coolidge tube for inoperable sarcoma of the tonsil has not retarded or arrested the growth in any manner. Radium has been used in this class of cases with no beneficial results. Radium is a reactive metallic element, difficult to isolate, and keep in its pure state. The material which is contained

in the tubes is a salt of radium, usually a double salt of barium. It is either a sulphate, bromide or chloride as a rule. The value of the salt is estimated by the quantity of radium element present in each combination. Whether radium cures by selective affinity or by changing the character of the cells, or whether it stops the growth of neoplasms by blocking the nourishment by a process of endarteritis; or whether anti bodies are produced by irradiation or by a combination of the above factors, is a question for speculation and argument as well as observation. As an adjunct and as a supplemental treatment to the knife it is of distinct value. With the knowledge that we now have of its action in cancer and sarcoma, it would appear to be the duty of every surgeon to resort to its use in certain conditions before and after operation. To obtain its most beneficial effects radium should be employed for the present, at least, only by a well qualified expert who is experienced in its application, and who has a wide knowledge of the special technic. The proper filtration, the time of exposure, and the amount necessary in each individual case, one who is familiar with the local effect of radiation upon the lesion itself, and upon the skin and the surrounding structures, as well as with all the other details necessary to a gratifying result. The expert ought to be a clinician understanding the various pathological conditions in which radium is indicated as well as a surgeon of capability, skill and experience. The large amounts of radium—250 milligrams used; the radium burn occurring one week following the application (denoting not the proper filtration) and the rapid growth of the glands and the metastasis showing the results of radium are the most important factors in conjunction with the case cited above.

300 Central Park West.



Conducted under the Editorial Direction of  
Dr. John W. Wainwright.

**Thromboplastin as a Hemostatic.**—Cronin (*Journal American Medical Association*, February 19, 1916) reports his experience with thromboplastin (tissue extract) as a hemostatic after operations for removal of the tonsils. He devised a combination operation with the tonsillotome and cold wire snare. He had capillary oozing from the nasopharynx until he began the use of thromboplastin. Immediately after the operation, a pledget of gauze saturated with the preparation was applied to the cut surface; also in the nasopharynx after the removal of adenoids. Strikingly good results followed, the patients showing only a little bloody saliva. Healing was hastened, many being entirely well at the end of four days.

These preliminary experiments were so favorable that the use of thromboplastin was employed in all of the department of health nose and throat clinics in New York City. A summary of the reports received from the various clinics include 2,036 throat operations in which the agent was used. There was no postoperative hemorrhage reported from three and very little from two of the five clinics. No vomiting from any of them, no bloody stools, while the general condition of the children was good from three, very good from one, nearly normal from one.

Dr. Cronin concludes that in not a single instance was the operator or nurse required to return to the clinic to care for a bleeder after operation.

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**Potassium Iodide in Pneumonia and Endocarditis.**—Baginsky, (*Archives für Kinderheilkunde*, November 13, 1915) writes that in his experience potassium iodide is not a specific in the pneumonias, endocarditis, etc., in children, but that it is

a powerful aid to the organism contending against these toxic influences. Symptoms indicating this agent are those of insufficiency of the respiratory and cardiovascular systems whether one or both are involved. Potassium iodide, the author thinks, acts directly on the vessels and tissues of the pericardium, plura and other serous membranes promoting diffusion and the secreting functions.

The dose given was from 1 to 3 grams a day. It is, he thinks, especially useful in endocarditis, pericarditis, and polyserositis following acute articular rheumatism.

**Venesection.**—Lawrence (*Boston Medical and Surgical Journal*, February 24, 1916) reports a number of disturbances in which venesection was employed and summarizes his conclusions as follows: If performed when properly indicated, venesection is not a dangerous procedure more especially as the amount of blood withdrawn is always under perfect control. In cardiac dilatation, renal toxemia, hypertension singly or in combination, it is confidently believed to act more promptly and safely than will drugs. It lowers blood pressure, at the same time produces an improved circulation in hypertension, but does not in proper quantity lower normal arterial tension; it should not be employed in the absence of well defined indications, nor should it be withheld until too late to be of service. The amount of blood to be withdrawn is to be determined by the point at which relief is in evidence. Lawrence believes that failure is generally due to a too small amount. Finally, he declares that repeated bloodletting when it is indicated, does not seem to exert any ill effects upon the blood composition.

**Radium in Arteriosclerosis.**—Field, *New York Medical Record*, January 22, 1916, advocates the use of radium in arteriosclerosis by means of emanation, inhalation, radioactive drinking water, solutions of radium salts for drinking, emanation baths, and by intravenous or subcutaneous use of bromide or chloride salt. Field declares that this treatment is free from toxic effects. The dose in cases with high

blood-pressure is governed by the condition of the case and the extent of involvement. He reports a series of 190 cases, the average reduction of pressure was 40 mm.

**Action of the Opium Alkaloids, Individually and in Combination on the Respiration.**—Macht (*Journal of Pharmacology and Experimental Therapeutics*, October, 1915) declares that the rate of respiration is markedly slowed by morphine, the number being on the average diminished one-third by moderate doses. Codeine also slows the respiration, but to a less degree. Narcotine and papaverine decrease the rate only slightly; the other alkaloids not at all; they increase respiration.

The action of combinations of these alkaloids on respiration is explained as the sum of their individual properties. Morphine with narcotine, morphine with papaverine and a mixture of the total alkaloids are less depressant to the respiratory center than is morphine alone. Narcotine and papaverine have a dilator action on the bronchi; so does morphine and codeine to a less degree; the other alkaloids, no action at all; morphine and narcotine neutralize or antagonize each other.

To sum up, morphine, and to a lesser degree narcotine are sedative or depressant; narcotine, papaverine, narcein, thebain and crypt topine stimulating to the respiratory center.

**Chenopodium in Uncinariasis.**—Bishop and Brosius (*Journal American Medical Association*, November 6, 1915) arrive at the conclusions that chenopodium is attended with less inconvenience and discomfort than from thymol. It can be given at shorter intervals and thus the cure be more quickly established than from thymol. It is nontoxic and a more efficient vermifuge than thymol in the treatment of uncinariasis.

**Bromides in Epilepsy.**—Turner (*British Medical Journal*, December 18, 1915) reports his experience with the use of the bromides, concluding that in 25 per cent of the cases their use brought about a reduc-

tion in both frequency and severity, and in many instances their ultimate arrest. The cases reported by Turner were mainly mild and free from mental symptoms. In another and similar number of cases, less marked, but noticeable good results were secured. In the remaining 50 per cent, the bromides had no influence. These last were the severe cases.

**Wound Treatment with Light from the Carbon Arc Lamp.**—An interesting report is given by Breiger (*Medizinische Klinik*, November 7, 1915) on the curative value of the white light from a carbon arc lamp. In a series of seventy cases, with in all 107 separate wounds, complete healing was secured in thirty-nine, while twenty-four of the remaining cases were discharged when healing had progressed so far as to require no further treatment. But one patient failed to respond to this treatment. The best results were obtained in those cases presenting in the earliest states. Healing of these cases was often complete within ten days. Light will often bring about fairly rapid healing, even of long standing when other measures have failed. Results in bone injuries are usually satisfactory; casting away of sequestra occurs promptly; infected wounds become sterile and heal. There is prompt relief from pain; while cosmetic results are good.

**Quinine in Conjunctivitis.**—Tweedy (*British Medical Journal*, January 1, 1916) recommends the local application of solutions of quinine in cases of infected and sloughing corneal ulcers as well as in infected conjunctivitis.

**The Simpson Light in Skin Diseases.**—Harmer and Cumberbatch (*London Lancet*, January 8, 1916) employed this measure in the treatment of several types of skin diseases. It results from an arc light the poles of which are composed of ores containing the tungstate of iron and manganese. From these electrodes the proportion of ultra-violet rays is greater than from any

other form of light, while the range of wave lengths is also greater. Their experience with this light showed it to be of value in the treatment of lupus, some forms of cutaneous syphilis, rodent ulcer, eczema and wounds. The light must be carefully limited and controlled.

**Uterine Carcinoma Treatment with X-Rays.**—Guggisberg and Steiger, (*Correspondenz-Blatt für Schweizer Aerzte*, December 25, 1915) report three cases of inoperable carcinoma of the uterus in patients, thirty-two, seventy-three and seventy years of age, successfully treated with the X-rays. In all the subjective symptoms were greatly relieved, while the tumors were much decreased in size or disappeared altogether. The authors do not claim these cases cured, but call attention to the relief which followed as sufficiently marked to consider the treatment successful.

**Radiant Light and Heat in Therapeutics.**—*The American Journal of Electro-therapeutics and Radiology*, January, 1916, declares that radiant light and heat are destined to fill an important field in therapeutics. In the European military hospitals the great value of these agents has been recognized, and a number of fifty candle power lamps have been installed and are now in use. Radiant energy from luminous sources is, it is declared, capable of producing heat in the deeper tissues, especially through the agency of infra-red rays, which have the greatest penetrating power, and which relieve conditions in the tissues into which luminous rays cannot penetrate. Reflexly an influx of an extra amount of blood takes place in these tissues while under treatment. The hyperemia resulting, increases local nutrition and phagocytosis and therefore exerts a useful therapeutic activity in a large variety of conditions.

**Salt Solution in the Treatment of Edema.**—Palhault (*Zentralblatt für Therapie*, 1915, p. 160), declares that when

edematous parts are wrapped in compresses wet with 2.5 to 5 per cent salt solution (sodium chlorid), over which is placed a layer of cotton and the whole then bandaged, that on the following day the dressings are saturated with fluid which may even soak through sheets and mattress. The dressing is renewed daily and often results in a disappearance of the edema when all other measures have failed. The patient meanwhile should be put on a so-called dry diet.

weaker solution, one-tenth per cent, should contain one-tenth per cent of hydrochloric acid or one per cent of alcohol.

**The Open Air Treatment of Pneumonia and Anemia in Children.**—Freeman, (*American Journal of the Medical Sciences*, January, 1916), outlines the method of treating cases of pneumonia in children at the Roosevelt Hospital in New York. They are given a dose of castor oil, put to bed on the roof, their extremities kept warm and bowels open. Stimulants or expectorants are very seldom used. Occasionally, when the cough becomes troublesome, a dilute solution tincture chloride of iron in glycerine is used. Results show that in such conditions of treatment pneumonia runs a short course with a very low mortality. The open air treatment also seemed to bring about remarkable improvement in anemia and leucocythemic conditions with little or no drugs. The author concludes that the treatment of children in an open air shed in winter increases their vitality and resistance to diseases more effectually than do medicines.

**Coal Tar in Chronic Moist Eczema.**—Thederling (*Berliner klin. Wochenschrift*, July 26, 1915), states that the proper application of preparations of tar is the most satisfactory and prompt means of drying chronic moist eczema. He gives preference to an anthracite tar with acetone, which is best applied direct to the surface and covered by thin gauze. Water or soap should be interdicted. In twenty-four hours the surface will begin to dry and a crust form in three or four days; this should be softened with a 2 per cent salicylic acid ointment. The scab can, as a rule, be removed by the seventh day by first bathing with warm water and some bland superfatty soap. The skin under the scab will be found soft, smooth and slightly infiltrated and perfectly healthy.

**Quinine Hydrochloride in Wound Dressings.**—Taylor (*British Medical Journal*, December 25, 1915) reports having made extensive use of quinine hydrochloride as a dressing for infected wounds. He uses wet dressings of a one per cent solution in cold boiled water, and a continuous irrigation of a one-tenth per cent solution. Taylor also used the one per cent solution for instillations and for hypodermic injections into the tissues surrounding infected wounds. This treatment was especially effective in the infections of the bacillus aerogenes capsulatus. The solution was also found an antiferment which prevented the formation of a suitable medium for bacterial growth by arresting the digestion of the tissue proteins. It further exerted a desirable inhibitory action against putrefactive organisms and acted directly as an anti-pyretic in many cases. It is nontoxic. The

**Copaiba Oil and Resin in Gonorrhea and as a Urinary Antiseptic.**—Stockman in the *British Medical Journal* (July 24, 1915) says that the object of his investigations was to obtain definite information as to whether the oil or resin, or both constitute the active constituents in oleoresin of copaiba. He gave the oil of copaiba 15 minimis three times a day, and 15 minimis six times daily; the resin 15 grains and 30 grains three times a day in emulsion. The separate action was first tested on three cases of gonorrhea, on hospital cases subject to daily observation. The resin gave no disturbance, but had apparently no effect on the urethral discharge. Subsequent treatment with oil of copaiba, 15 minimis six times daily was followed by distinct improvement. Both substances, the author states are excreted in the urine. He believes that the resin is inert or nearly so, while the oil exerts a distinct antiseptic effect in delaying putrefaction and in hindering the growth of certain organisms artificially added to sterile urine.

Conducted under the Editorial Direction of Dr. Henry R. Harrower.

**Pituitary in Pulmonary Hemorrhage.**—In the April, 1916, *The Critic and Guide* Robinson makes editorial reference to the experience of Konikow, of Boston, in the control of pulmonary hemorrhage with pituitary extract.

While the field of the use of pituitary extract is ever increasing its use as a hemostatic in pulmonary hemorrhage has not been recorded before. Konikow relates a case of very severe hemorrhage of the lungs in which hypodermics of pituitary (1 mil or cc.) has proved remarkably efficient on three different occasions. According to Konikow this effect is probably due to its constrictive action on the peripheral blood vessels, but to Robinson this explanation is not satisfactory for he believes that such peripheral constriction would result in a greater blood pressure in the pulmonary vessels and thus increase the hemorrhage. Robinson characteristically adds: "However we are not concerned with theories but with facts." The case reported is as follows:—

The patient, a druggist age 32, had previously had several hemorrhages and in childhood a cold abscess which emptied itself in two places on the left side of the chest. He had been working hard and for long hours. He was taken with a severe hemorrhage, was removed to his home in a taxi and the doctor found him coughing and spitting up considerable amounts of blood, pulse easily compressible and 104 per minute. Without further examination ice was given and applied locally and 1 mil of pituitary injected. Within 10 minutes the pulse dropped to 76, was less compressible and apparently the hemorrhage controlled. Some time later these experiences were repeated with similar results. Still a week later a third hemorrhage occurred and an-

other physician gave codeine per os in one-sixth grain dose. Sixteen hours later when seen by Konikow the hemorrhage was profuse, a mouthful of blood with each cough. Pulse very weak, rapid and irregular at times. Pituitary (1 mil) was injected and, because of the patient's weakened state this was followed with strychnine, 1-30 grain. The response to treatment was as before and he is now enjoying good health.

It is well to remember that adrenalin is contraindicated in such cases and that Konikow's results indicate another useful application of a most useful drug.

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**The Placental Internal Secretion and Its Endocrinous Relation.**—A number of men are working out some more definite conclusions regarding the role of the placenta as an internal secretory organ. Already in this department mention has been made of the effective application of placental organotherapy as a galactagogue (AMERICAN MEDICINE, Jan., 1916, p. 62 and Mar., 1916, p. 196). This is being more extensively tried and doubtless reports will be forthcoming later. It is confidently believed that they will be encouraging.

In the meantime it is of interest to learn that Ercole Cova (*Ann. di Ostet. e Ginecol.*, Sept., 1915) has made a large series of experiments to show that the placenta produces an internal secretion which, passing into the circulation, reaches certain remote organs and stimulates them. Cova has attempted to reproduce experimentally the well known phenomena which take place in the uterine mucosa during pregnancy. He has artificially limited pregnancy to one horn of a bicornuate uterus and noted that the same mucosal hypertrophy went on in

the separated portion as in the normally connected portion of the uterus.

Cova also repeatedly injected placental extracts into rabbits and guinea pigs with resulting changes in the mammae, uterus and vagina similar to those occurring during pregnancy. These changes are fully outlined in the original article and, briefly, are as follows: The rabbits' ovaries increased in volume, there was a diminution of the follicles with degeneration, the interstitial gland was increased and in the rabbit took the place of nearly all the ovarian tissue, the corpora lutea were hypertrophied. In the breasts there were evidences of hypertrophy and lipoid cells were found, similar elements were found in the uterine mucosa and the myometrium.

It is reasonable to deduce some idea of the causes of the differentiation of the corpus luteum of pregnancy from those of menstruation. The greater development is the result of the internal secretory influence of the placenta. Other hormonal influences were noted in the adrenals and thyroid, the former, and especially the corticular cells, increased in size while the endocellular granules which are believed to be the chief secretory factors in the thyroid, were increased.

Cova suggests that placental extracts may be used in therapeutics with good prospects of success. He recommends this method in the treatment of cases of uterine hypoplasia and the usual conditions associated with this, chiefly sterility. In hemorrhagic metritis, it is remarked, amenorrhea may be brought about by administering placental extract with the expectation of bringing on the anatomical and functional modifications which simulate the pregnant type and which with such frequency have been produced experimentally in animals.

Thus does placental organotherapy bid fair to assist us in the control of certain intricate functional dyscrasias in gynecological practice.

dietetic measures. (A full resume of this appears in the *Jour. A. M. A.*, Apr. 1, 1916, p. 1063). Certain parts of this information are worth mentioning here for in reality they are nothing more or less than organotherapy.

In the place of milk Kleinschmidt recommends vegetables and meat suitably prepared and he lays special stress on the value of calves' or chicken livers and sweet-breads very slightly cooked and forced through a sieve. Four feedings are given each day and the above constitute a part of the fourth meal, i. e. the organotherapeutic purée is given once daily for some weeks or months.

Whether this somewhat radical method of infant feeding will become popular it is not for us to say, but at least it is of interest to remember that there are principles in both the liver and the pancreas which have a distinct therapeutic action in digestive troubles and, of course, the anemic conditions which result from them.

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**Red Bone Marrow in Anemia.**—In the so-called "secondary anemias" one of the best remedies is red bone marrow. Some years ago, when this preparation was given more attention than it is now receiving, it was recommended and used in pernicious anemia. The results were not particularly good and what little benefit was obtained was fleeting. Many such experiences discouraged the profession and now preparations of red bone marrow are not used as much as their usefulness indicates—in secondary anemias.

Ormsby (*Med. Summary*, Mar., 1916, p. 23) speaks favorably of his experiences with red bone marrow and calls it an open sesame to the cure of many ailments that follow on malnutrition, especially in the marrow itself.

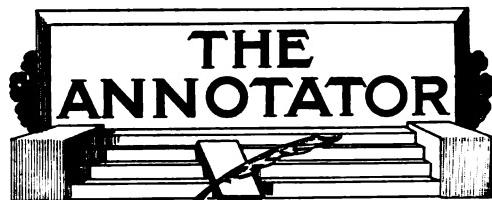
As an adjuvant in the anemia secondary to syphilis this remedy is well spoken of: "Anyone," says Ormsby, "who uses it in syphilis, after reading this article, will thank me many times when they see the pale, cadaverous, weak, trembly, anemic patient turned, in a few days, into a buoyant, hopeful, thankful individual." Of course it does not supersede salvarsan and is not used as an antisyphilitic.

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**Organotherapy in Infantile Anemia.**—In the February issue of the *Jahrbuch für Kinderheilkunde* (p. 97) there is a comprehensive consideration of alimentary anemia in infants and children in which special stress is laid by Kleinschmidt upon certain

In malnutrition, especially that associated with such intractable conditions as hip-joint disease, red bone marrow is very useful. Not only is the nutrition enhanced, but the pain and other symptoms of the progressive disease are modified, and at the same time the red-cell count is decidedly altered.

Red bone marrow has been in use for many years. We have been learning much about the value of various hematopoietic remedies and, perhaps, have forgotten some of the good results we used to obtain with marrow. It is sufficiently valuable to be used with much greater frequency, and doubtless, this reference by Ormsby may serve as a helpful reminder of the utility of this remedy.



### The Menace of the Unclean Soda Fountain.—

One need only to stand for a few minutes near to any busy soda fountain and observe the customers served and the work of the clerk or clerks in charge to realize the dangers constantly presented. In spite of the best possible equipment and every facility and convenience, the personal equation of the clerks who

prepare the different beverages and care for the glasses, the various materials, and the apparatus generally, must constantly be reckoned with. In the rush of serving many customers and meeting hurried demands, the tendency to slight the various procedures necessary to secure cleanliness and safeguard the patrons, is very great. That faulty or careless methods of cleansing soda fountain glasses or receptacles offer real dangers cannot be doubted, especially in view of the promiscuous character of those who are continually being served.

Thus for example Dr. Tanza, in an article in the *U. S. Public Health Reports*, discussing the interstate migration of tuberculous persons, says that soda fountain utensils are common eating and drinking devices in the most vicious sense of the word. He has seen advanced consumptives at soda fountains, and as soda fountains are common rendezvous for children, the danger is apparent. Soda fountain attendants are likely to be careless in the handling and washing of cups, spoons and glasses, and he has observed on more than one occasion advanced consumptives put down glass and spoon which were then carelessly rinsed in standing water and placed on the shelf for the next customer. He says that in hotels, cafes and other eating places, tableware is generally cleaned in machines, or at least soap and hot water are used, and while po-



**Corpus Luteum in the Nausea of Pregnancy.**—Hirst of the University of Pennsylvania (*Jour. A. M. A.*, Feb. 26, 1916, p. 645) reports five cases of nausea of pregnancy which he treated with daily injections of a soluble extract of corpus luteum (1 mil representing 20 mgm.). Four were successfully treated and one, a case in which a large goiter was present, did not respond to four injections of the luteal extract.

It is suggested by this writer that there is more than a coincidence between the formation and disappearance of the corpus luteum of pregnancy and the cessation of the nausea and, according to Hirst "it is not unreasonable to suppose that there is a sufficient absorption from the corpus luteum of pregnancy to account for the disappearance of the nausea, especially when one realizes that the nausea begins to diminish at the time the corpus luteum has reached the acme of development."

Hirst hints that the above dosage—which, by the way, is not intelligible for it is not stated whether the 20 mgm. represents fresh or desiccated luteal substance—is too small and will have to be increased materially. Ordinarily corpus luteum is given by mouth with expectations of good results. It is clear, however, in cases of this character that there is an advantage in the intramuscular method recommended in the above article.

tentially sources of infection, the danger would be less than by careless rinsing.

The New York City Health Department's regulations, as a writer in the *Practical Druggist* points out, require that stands and stores selling soda waters and similar beverages have an adequate supply of running hot water so that they may properly clean their utensils and receptacles. This is all right as far as it goes but the next thing is to insure that this hot water is used with care and thoroughness. As we have previously said, the equipment of a soda fountain may be ever so complete, but it will be of little avail unless used with the painstaking care that is required. What seems to be needed are stringent regulations covering the cleansing of every glass, dish or receptacle used at every fountain, with severe penalties to the proprietors as well as to the clerks for neglect.

The health officials in a good many states are beginning to recognize the importance of supervising the public soda fountain, and according to the *Practical Druggist*, the Ohio State Board of Health has adopted a new and very stringent regulation requiring the sterilization of all glasses, ice cream dippers, spoons, serving dishes or anything else coming in contact with ice cream, soda water or sundaes, and all such utensils must be sterilized with either boiling water or by steam. If water be used the articles must first be rinsed in cold water, then thoroughly washed in hot water with soap or cleaning powder, then exposed to live steam or boiling water from three to five minutes, then rinsed in cold clean water and wiped with a clean dry towel. This must be done with every glass, sundae cup, spoon, ice cream dipper, or any other utensil containing ice cream or soda water, before same is used again, and suitable provision must be made for taking care of sterile glasses so that they will be kept clean until used. If it is impossible to make arrangements for live steam or boiling water, then paper cups and individual spoons must be used. Refrigerators must be kept clean and free from infection, and straws are forbidden except when they are protected from dust, dirt and handling by employees.

The importance of procedures like the foregoing cannot be overestimated. The wholesome, well conducted and thoroughly clean soda fountain has an important mis-

sion to perform, for it is a factor not only in the promotion of practical temperance but also one capable of contributing in no little degree to the comfort and pleasure of the people generally. It is intolerable that anything so useful and pleasurable should be allowed to jeopardize the health of the people. It has been said that as the public become educated to the importance of soda fountain cleanliness, the matter will adjust itself, for owners of fountains will maintain a high degree of cleanliness as good policy and to attract patronage. To a certain extent this may be so, but we still believe that well drawn regulations similar to those of the Ohio State Board of Health, will when rigidly enforced, have an effect on careless, thoughtless attendants that can be obtained in no other way.

**Some Good from the War.**—While the great struggle going on in Europe at the present time is so terrible in its general aspects, and so awful in its consequences that it is almost impossible to see how any good can come from it, it may be that certain benefits will ultimately accrue, indirectly at least, to mitigate some part of its evils.

This thought is suggested by a correspondent to the *Sun* who in writing from France calls attention to the remarkable way the war has diffused surgical and medical ideas among the working and agricultural classes which previously were lamentably ignorant of all such matters, knowing absolutely no more than such classes knew in the Middle Ages.

When a man fell ill, continues this writer, before his kinsfolk summoned the doctor, always the last resort, every sort of old woman's remedy was tried, from decoctions made of all sorts of things to liquids over which crazy incantations had been made. In case of a wound, a slight one, a small cut or a thorn prick was entirely disregarded, not washed and often not covered up, with the result, anthrax, tetanus, &c., and many deaths. If a serious wound, a cut from an axe or a machine accident, occurred, a rush was made for cobwebs, collected in the dusty lofts or dirty stables. These were made into



a pad and placed on the wound. Nine times out of ten inflammation would set in and amputation be necessary or gangrene would finish off the patient.

"All this sort of thing is changing and by reason of the information being spread by Army methods is likely to disappear. The poilus who have seen the care taken about infection by modern surgeons are treasuring up the knowledge they have gained from noting the methods employed, and will spread the facts they have learned when they go back to civil life, for the thousands of wounded men who have passed through hospitals will never forget how carefully wounds were cleaned and how simple yet efficacious bandages were put on.

Soldiers on leave are already doing something to spread the light. M. Cunisset Carnot, writing in the *Temps*, tells of how an accident occurred in his village the other day, a man ploughing having injured his leg with the point of a ploughshare. "I reached the man's house at the same moment as an old woman who had, in kindness, hurried to collect a lot of cobwebs," M. Carnot writes. "But her kindly effort was wasted, first, because the family had already collected a lot and, secondly, because the dressing was already done. A brave poilu, on permission, had dressed the wound, using his regulation dressing, which he had happened to bring with him on his leave, in front of a crowd of some twenty villagers, who had gathered there amazed and incredulous.

"The family of the injured man looked on with visible discontent but without daring to oppose the work. He cleaned the wound with boiled water, put on several thicknesses of gauze after applying iodine to the wound and around it. The peasants watched him, smiling with amused contempt. When the doctor came next day he approved of the treatment and repeated it in the same way. To-day the cure is complete and the man at work again.

"Similar lessons are being given all over the country and no one can question the good effect they must have." With every soldier going back to his home an active propagandist for the ideas in regard to hygiene, sanitation and personal cleanliness which he has learned to respect not only through army discipline but because of the results he has seen, it cannot be doubted

that great and permanent good will follow. Thus one small patch of silver lining can be seen back of the clouds of war.

**The Avocado—or Alligator Pear.**—A characteristic development of modern life is the improvement in the food supply. There is today greater diversity in food stuffs, less seasonal variation, more intensive cultivation, more cold storage food, and a greater awakening as to the importance of rational dietaries than during any previous age.

There are many foods which have been introduced into this country by immigrants, which have gained but slight popular favor. Others have been imported for purposes of study and investigation or horticultural experiment. Particularly, among the fruit trees have innovations been numerous. Fruits play an important part in the dietary, though their cost is at times prohibitive of the widest usefulness.

Among recently introduced fruits the alligator pear deserves attention. Its present high cost is unfortunate inasmuch as it deprives all save a small and wealthy part of the population from utilizing a most excellent, palatable and valuable food. Popularly known as a vegetable butter, it possesses chemical peculiarities which isolate it among fruits. M. E. Jaffa (College of Agriculture, Agricultural Experiment Station, Berkeley, California, *Bulletin No. 254*) reports his most suggestive investigation of 28 different varieties of avocado or alligator pear.

Fruits in general derive their main food value by reason of their carbohydrate content. Their proteins vary up to 2.5 per cent, while the stone fruits generally contain less than 1 per cent. Fat is present, as a rule, in a negligible proportion in fresh fruits. Considering these facts, the avocado is virtually in a class by itself, and departs from fruit standards.

The analysis of the edible portion of avocados averaged protein 2.08 per cent, fat 20.1 per cent, carbohydrates 7.39 per cent and ash 1.26 per cent. These figures are higher than those presented by Wiley (*Foods and their Adulteration*): protein

content 1 per cent, fat 10.20 per cent, carbohydrates 6.80 per cent, and ash .90 per cent. The discrepancy is probably due to the fact that Jaffa's analyses were based upon the edible portion, while those of Wiley apparently included the entire fruit.

It is noteworthy that the protein content is more than twice as great as that customarily found in stone fruits. The carbohydrate content is exceedingly low, while the amount of mineral matter is much greater than that found in any fresh fruit. While the nutritive value of the ash content depends upon the percentage of potassium, calcium, phosphoric acid, iron, etc.—facts still in course of determination—it is significant that the ash percentage of the avocado is greater than that determined for apples, grapes, blackberries, oranges, pears, and plums. Merely from the standpoint of protein and ash content, the avocado merits attention for its value as a fresh fruit. The striking characteristic, however, is the high fat content. An average of 20.1 per cent fat carries its fat value above the average of the commonly used olive.

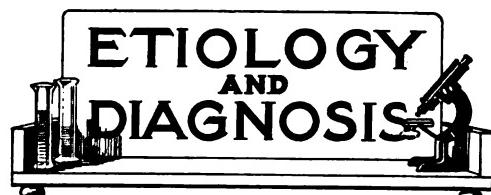
The energy value of food stuffs is not clearly expressed in terms of calories. The total food value, however, is thus indicated; and from the standpoint of energy, the value of a food may be said to vary directly with its caloric value. While this represents energy value, it by no means evidences the source of calories. Ordinarily, however, fruits possess low caloric values, ranging from 175 calories to possibly 400 calories per pound. The average of twenty-six varieties of avocados gave a value of 984 calories per pound or more than twice the maximum noted for other fruits. When it is realized that the energy value of a pound of sugar is 1820 calories, while that of lean meat is slightly less than 1000 calories, it is obvious that the available food energy value of the avocado is unusually high.

The problem of digestibility is definitely bound up in the actual food value, in so far as assimilability is a pre-requisite for securing the maximum nutrition from any food stuff, regardless of its theoretical caloric value. There is no reason to assume, however, that the avocado is less digestible than other fruits. Metabolism experiments are essential in order to determine the coefficients of digestibility, so necessary for calculating the actual food value of the avo-

cado to the consumer. Possessing the general properties common to most edible fruits, its use is to be urged because of its particularized characteristics, notably the high percentage of vegetable fat.

If this fruit proves to possess unusually desirable qualities because of its peculiar composition, its cost should not debar it from general consumption. Theoretically, at least, it should possess a marked laxative value and be of especial worth for persons suffering from various forms of constipation. The substitution of a vegetable oil for a mineral oil probably would not be mechanically effective, but the combined service of the oil as a lubricant and as a nutrient should give the avocado a special advantage in meeting the needs of such conditions.

The present price of avocados is prohibitive to the general public, and as a result it is a comparatively unknown fruit. There is little economic value in the handling of such a commodity. Most of the orchards in this country are young, but when they come into bearing the fruit will be more common and it is probable that the price will be lower. Instead of being used by epicureans as a palatable salad, it will probably assume a greater usefulness. It is destined to take a prominent place among future food stuffs, not merely as a source of organic acids, mineral salts, and protein but most especially as a rich container of vegetable fat.



**The Silence of Renal Tuberculosis.**—If renal tuberculosis sometimes gives no localizing symptoms, asks Gordon (*Surg. Gynecology and Obstetrics*, Feb., 1915), what is to lead one to suspect its presence and how is diagnosis to be made in "silent" cases?

Tuberculosis of the kidney should be thought of—

1. When a patient presents himself for loss of weight and strength when no other cause can be found, if there are pus-cells in the urine.
2. When he presents himself for hematuria; and, finally,
3. When he consults us for cystitis: for although tuberculosis of the kidney may give no symptoms, tuberculosis of the bladder, secondary to renal tuberculosis, practically

always speaks out and in advanced cases speaks out very loudly.

**Diagnosis.** There are always pus-cells in the urine. If the case is one of hematuria, the leucocytes may be masked by the large numbers of red cells; but after the bleeding has stopped the pus-cells will be found. The only possibility of the pus-cells being absent occurs when the tubules or ureter through which they come is blocked. One must be on guard if the urine is alkaline; then the pus-cells may lake on standing, and for this reason all urine should be inspected microscopically as soon as possible after it is voided. It is my custom always to have the specimen passed in the office, not brought in a bottle.

Pus being present in the voided urine, it can be demonstrated that it comes from a source above the urethra by the "two-glass test" or by catheterization. Pus in the second glass or in the last of the flow through a catheter is presumptive evidence of a seat of inflammation in the upper urinary tract.

This inflammation may be caused by one or many of the pathologic microorganisms. For the most part they get along very well together. The gonococci and staphylococci are perhaps most frequently associated, the colon bacillus and the proteus bacillus more frequently are solitary invaders, but any of them may be found with the tubercle bacillus. Generally the tubercle bacillus is alone at first and cultures will therefore be sterile. Beware a pyuria sterile to culture! And, on the other hand, do not consider a cystitis nontubercular because other microorganisms are present.

After pus has been found, stain for tubercle bacillus. If they cannot be found it does not follow that they are not at the root of the condition. Some claim that they can be demonstrated in 60 per cent. or 90 per cent. of cases. This percentage is altogether too high an attainment for most of us to achieve.

If tubercle bacillus cannot be found in the urine lose no time with the von Pirquet or Moro tests. If the temperature is normal inject  $\frac{1}{2}$  mg. of old tuberculin hypodermically and increase the dose if no reaction follows. If no reaction follows 2 mg. we may take it for granted there is no tuberculosis. Culture the urine. If it is sterile or if old tuberculin gives a reaction seek anew for tubercle bacillus in the urine and if again unsuccessful use the guinea-pig test. If this is negative, even if the old tuberculin test is positive, we have excluded tuberculosis of the urinary tract as nearly as possible. The only chance of error is that the focus is sealed so that no bacilli get into the urine. There are two other simple tests which may be tried for what they are worth. In tuberculosis the bladder is said to be extremely intolerant of silver nitrate irrigations, and when this salt is very badly borne it is suggestive. The second test is made by pressure on the ureter through the vagina or rectum. If renal tuberculosis is present a referred pain is felt in the kidney region. If tuberculosis of the urinary tract is present, its main focus and extent in "silent" cases must be made out by means of the cystoscope

or by exploratory operations over both kidneys. This latter course is inexcusable when ureteral catheters can be passed, but advisable when they cannot. If this routine is followed fewer cases of renal tuberculosis will reach the surgeon at a stage when interference is hopeless.

In conclusion Gordon sums up and makes additions to the main point of his paper as follows:

1. Renal tuberculosis gives no local symptoms in a large percentage of cases.
2. Its first manifestation may be hematuria or symptoms of its spread to the bladder.
3. A history of gonorrhea or the finding of colon bacillus, staphylococci, or other pathological microorganisms in the urine in no way excludes the concurrent presence of tubercle bacilli. In fact, renal tuberculosis predisposes the urinary tract to other infections and the tubercle bacillus is usually reinforced by such allies before it has progressed far in its invasion.
4. The importance of early diagnosis of tuberculosis is fully recognized when the lungs are involved. It should be as fully recognized when its main focus is in the kidney; for it is usually unilateral at first, when the whole focus can be removed and the patient cured, but in time may become bilateral or miliary, when the case is hopeless.



**Lupus of the Larynx.**—Kingrin (*Inter. Jour. of Surg.*, Apr., 1916) in his interesting article on Diseases of the Nose, Throat and Ear says that treatment of lupus of the larynx may be either medical or surgical. Pfannenstiel has had excellent results in the Finsen Light Institute in Copenhagen. His method consists in the internal administration of the iodide of sodium, thirty grains daily. Subsequently, the patient is given inhalations of ozone, or, where this is not practicable, the application of an acidulated solution of hydrogen dioxide is made directly to the affected part. The result of this combination is the liberation of free iodine which has a strong bactericidal effect. (E. Mayer, in *Reference Handbook of Medical Sciences*).

The application of a preparation called ulsanin, which is a hydro-iodoborate, directly to the affected part has been recommended. It is powerfully hydrosopic, and therefore must not become moistened in any way before its application to the diseased part.

Koichi Fujinami has recommended the use of the parallel rays of the Finsen lamp in the treatment of lupus. A funnel is attached to the distal end of the apparatus with water blowing about the mouth end. The patient is

seated, tongue protruded, and the funnel end is inserted into the mouth and set with a thumb screw. At first the treatment is given once daily, for from three to five minutes; but as soon as the patient becomes accustomed to it the sittings are increased to from fifteen to twenty minutes. Reaction, in the shape of pain on deglutition, redness, and tumefaction, occurs after five or six applications, and from this time improvement begins and the treatment must be temporarily discontinued.

The high frequency current has been recommended by Albanus, while Sufranek advises the use of superheated air, reaching the lesion through a laryngo-fissure.

The treatment by tuberculin must, if used at all, be carried on most carefully, beginning with very minute doses, as the injection of tuberculin tends to produce a laryngeal edema and increase the already existing stenosis.

*Operative treatment* gives the quickest and surest results. It should consist in the removal of lupoid nodules under cocaine anesthesia and the application of the galvano-cautery or 50 per cent. lactic acid. The applications should be made every third or fourth day, until cicatrization is complete. Where stenosis following cicatrization is so great as to interfere with respiration, tracheotomy may have to be performed. Intubation is not effective in these cases, because, in the first place, it is difficult to introduce a tube of sufficient size, and, in the second place, the trauma produced by the presence of the tube tends to excite the disease to renewed activity. Guild has reported a case of lupus of the larynx in which he performed tracheotomy, thyrotomy, and removal of diseased tissues, with no recurrence after eight years.

**Ringworm of the Hands and Feet.**—Lane in his interesting article in the *Boston Med. & Surg. Jour.*, suggests the following treatment: The mechanical removal of the superficial layers of the skin is an important part of the treatment. This is well accomplished by soaking and then scrubbing with a moistened cake of pumice stone or coarse sand soap. Sabouraud says that on the hands this treatment is more useful than antisepsis, and that the lesions can be cured by this treatment alone in most cases. As an antiseptic application he recommends a 1% solution of iodine in 60% alcohol. On the feet a similar treatment is used but the solution of iodine is employed from the start. If this is not successful, a 1% chrysarobin ointment is applied. Hartzell recommends the ointment suggested by Whitfield, which is composed of 3% salicylic acid and 5% benzoic acid. After there is apparent cure the treatment is suspended for a week and then resumed for a few days with view of destroying any fungi that may have escaped. If dermatitis is caused by the antiseptics used, they are replaced by a soothing ointment until it has subsided.

In cases in which ringworm may be suspected, but in which it is impossible to demonstrate fungi, it may be wise to try such treatment, for a trichophytosis, treated as an eczema,

or untreated, will continue indefinitely. Sabouraud mentions having seen one case of more than three years' duration.

Ringworm of the nails is exceedingly difficult to cure. The best treatment appears to be to scrape the affected parts of the nails frequently, and to keep an antiseptic ointment applied as constantly as possible.

**Angina Pectoris.**—Byron Bramwell in his interesting article in the *Edinburgh Med. Jour.* gives the following views of the mode of production of the pain in angina pectoris:

1. That in the ordinary typical cases in which the pain radiates down the left arm, the afferent nerves of the heart distributed to or over the left ventricle are irritated; that the exact manner in which this irritation is excited (whether localized spasm, increased tension in the cavity of the ventricle, etc.) is still undecided; that the exciting cause of the pain in this and indeed in all types of angina pectoris is usually increased blood-pressure, whether actual or relative (walking uphill, against a wind, etc.); that over-distension of the stomach (walking after a full meal, flatulent distension, etc.) is a frequent exciting cause of the attacks; that in some cases emotional excitement is the exciting cause; that in other cases there is no apparent exciting cause.

2. That in the exceptional cases in which the pain is reflected to the right arm alone, the afferent nerves distributed to the aorta or passing over the aorta from the right side of the heart are irritated; that perhaps in some of these cases (though this seems to be less likely) the afferent nerves distributed to and over the right ventricle are directly irritated in the same way that the nerves distributed to or over the left ventricle are irritated in the ordinary cases.

3. That in some of the cases in which the pain is referred to both arms, the irritation first passes to the left side and then over to the right side of the spinal cord, and so first to the left and then to the right arm; in other cases the irritation first passes to the right side and then to the left side of the spinal cord, and so first to the right arm and then to the left arm.

He believes that in the cases of angina pectoris in which the pain radiates to the right arm alone, or to both arms, the aorta is much more frequently diseased than in the cases in which the pain is confined to the chest or in which it radiates to the left arm alone.

**Roentgen-Ray in Gastro-Intestinal Affections.**—Aaron, in his article in the *American Journal of the Medical Sciences*, comes to the conclusion:

1. That the Roentgenologist should be a trained and experienced anatomist and pathologist.

2. That there should be standardization of methods and technique.
3. That the physician acquire the ability to properly estimate the diagnostic value of a Roentgen ray report.
4. That the patient should not be subjected to operation without a confirmation of the original findings by a second Roentgen examination made after an interval of two or three days.
5. That the clinician must not attach too much significance to the Roentgen-ray findings unless they are absolutely decisive.
6. That the lesion discovered by the Roentgen-ray must be a constant finding, regardless of position or slight variations in technique.
7. That great care must be exercised to differentiate physiological and spastic conditions from those that are essentially pathological.
8. That the Roentgen-ray report should be considered on the same basis as any laboratory report.
9. That the physician must carefully correlate the Roentgen-ray findings with the anamnesis and the clinical and laboratory findings.

**Treatment of Infections of the Ear, Nose, and Throat.**—R. E. Moss (*Texas State Journal of Medicine*, April, 1916) advises the use of autogenous vaccines. He considers a rise of temperature of one or two degrees a reaction and this rise should be followed in from twelve to twenty-four hours by a fall in temperature and an increase in appetite. The vaccine should be repeated at intervals of from two to eight days, depending upon the reaction. In chronic cases the doses are larger than in the acute. Average initial doses of the most common bacteria are: *Bacillus septicus*, fifty million; *Micrococcus catarrhalis*, two million; *M. paratetragenus*, twenty-five million; *pneumococcus*, twenty-five million; *influenza bacillus*, fifty million; *bacillus of Friedlander*, fifty million.

**Hyperosmosis In the Treatment of Wounds.**—Sir A. E. Wright has been making some interesting studies of osmotic tension and the influence of hypertonic saline solutions in the treatment of wounds of war. His experiences and conclusions are not merely of value to military surgeons, the principle is the same in all wounds and his results are of interest to every physician.

He uses solutions of common salt. A 2% solution, he found, will inhibit and a 5% solution will completely stop the growth of pyogenic organisms. Of course solutions of this density cause an exosmosis of the fluids of the tissues and this in itself is a great advantage. Wright found that hypertonic saline solutions also favor the breaking up of many of the leucocytes that have come to the surface of the wound, and with this there is a coincidental liberation of the trypsin contained in the white cells

which is often sufficient to cause a helpful auto-digestion in the wound.

The net result of this treatment—bathing with hypertonic salt solution or lightly wrapping a bandage and saturating it with the solution or dripping it into the wound—is to soften and remove the superficial sloughed tissue, and to control in a very definite manner the proliferation of bacteria. Sir Almoroth Wright is an authority, he has had hundreds of opportunities to try this method and he would not report it as carefully as he does in the *Lancet* (November 13, 1915), if there were not more than a modicum of value in the procedure. It is worth using.

**Iodine in Infections and Erysipelas.**—Iodine is still a good antiseptic and in wide usage, even though it seems to be somewhat in the discard in the hands of some military surgeons. As a disinfectant of the skin, it still has no peer, but its use in deep, jagged and dirty wounds is not efficient and it is quite painful. Recently an Italian physician, Maggi, records brilliant results in the treatment of erysipelas with iodine. He painted the affected area with the pure tincture of iodine and the results prompted his report in a recent issue of *Il Policlinico*. He adds, however, that where the toxemia is great, local treatment is not sufficient, hence in the severest cases he administers antistreptococcus serum as a supplementary measure.

**The Treatment of Conjunctivitis.**—Thomas G. Atkinson (*Medical Brief*, December, 1915) gives a very concise outline of a successful treatment of acute conjunctivitis. The other eye is carefully sealed off and under no consideration is the patient allowed to open up the bandage. The affected eye is irrigated with a 1:500 permanganate solution, every two hours, and in the interim a light bandage is placed over the eye and ice bags are applied to reduce the inflammation. After twelve hours of such treatment he instills a few drops of a saturated solution of methylene blue. After the acute manifestations are controlled, the cold applications must be promptly stopped for fear of nutritional damage to the cornea. The everted conjunctiva is brushed daily with a 1% silver nitrate solution. During the treatment outlined, it is well to administer an autogenous or, more convenient still, a stock vaccine of the kind indicated by the bacterial field.

**Gasoline as a Local Treatment for Wounds.**—Arbour Stephens of Swansea (*Lancet*, Dec. 18, 1915) mentions his successful use of gasoline (petrol) as a local treatment for ulcers and suppurating wounds. His experience has now lasted two years, for he first recommended this measure in 1913 (*Dublin Jour. Med. Sci.*, Dec., 1913). Since then many opportunities have been afforded to test this well-nigh universal

product and it has consistently proved itself useful and convenient.

In his most recent paper Stephens remarks that water has little cleansing value for wounds in which colloidal material has accumulated, whilst gasoline which dissolves fats and materially alters the surface tension, produces a clean wound very quickly and, provided it is allowed to evaporate freely, its application causes little or no pain.

**Life-Saving Intracardiac Injections.**—The injection of cardiac stimulants directly into the heart muscle or ventricles of dying patients is doubtless an old procedure, says an editorial writer in the *Medical Record* (May, 1916), but with little or no permanent benefit to report from it. Had results been attained which were commensurate with the kind and degree of the intervention, such resources as direct cardiac massage and simple needling of the heart would not be regarded as the very last resort in heart failure. Cases of life saving may have occurred in which intracardiac injection may have been one of a number of desperate remedies invoked.

Ruediger, in the *Muenchener medizinische Wochenschrift* for January 25, reports a case in which life was practically restored to an elderly woman by an intracardiac injection of a little strophanthin. The case occurred in the Marburg Medical Clinic. An elderly woman had been admitted in a state of cyanosis and edema of cardiac origin. There was double hydrothorax. The heart was dilated on both sides, pulse 140 and fluttering. The original lesion was apparently mitral, both obstruction and regurgitation. To the ordinary cardiac stimulants there was absolutely no response. The author tried to find a vein in which to inject strophanthin, but owing to the feebleness of the circulation none could be located. The injection was then thrown directly into the heart muscle and the response was prompt and decisive. The patient was now placed upon the indicated treatment and made a relative recovery. She remained in the clinic for five months and was in such a good condition when discharged that she may survive under favorable conditions for a number of years.

Animal experiments have shown that in intracardiac injections there is no danger of air embolism, because even if air enters the ventricles no harmful results can be noted. Again, the puncture made by the needle closes up so promptly that in a day or two no trace of it can be found. The author has performed the operation a number of times since 1909 and has evolved a technique. The injection should be aimed at the base of the heart, where motion is

least. The upper part of the right ventricle seems to be the best site.

**Exercise for the Aged.**—Nasher in his interesting article on Recreations for the Aged (*Amer. Jour. of Clinical Med.*, May, 1916), says the best form of recreation from mental labor is physical exercise. Here, again, we have to deal with the physical capacity of the individual. An old man cannot take part in the strenuous athletic sports or gymnastic exercises, although many aged persons keep up systematic calisthenics. This however, is taken up as a routine exercise and not as a recreation. Golf, croquet, outdoor bowling are all good physical recreations for the old man. Fishing, when the fish bite, is a most enjoyable recreation, and it can usually be graded, from the lazy fishing for flounders from a flat-bottomed moored rowboat to the more strenuous fishing for pickerel and trout in inland waters and the blue-fish and larger game-fish in the ocean. Hunting for small game is good recreation as long as the arm is steady and the sight is good.

Further, witnessing athletic and other sports constitutes a sensuous form of recreation in which the emotions are involved. Whether it prove beneficial or detrimental will depend upon the temperament of the individual. If he becomes greatly excited over the outcome of a race or game, it will do him no good to witness it. If he is naturally cool and accustomed to such races or games, it will do him no harm. The presbyopic eye does not readily adapt itself to varying distances, and this spoils the pleasure of seeing a horse-race or any other race in which objects at various distances must be seen at the same time.

Walking should be taken up, not as a recreation, but as a routine exercise. As the aged sometimes become absent-minded and sometimes suffer from vertigo, they should have agreeable company on their walks. For the purpose of recreation, the best walks are those taken in unfamiliar places, with mild changes of grade and frequent opportunities for rest. Pleasant company is indispensable on such walks. Aged persons sometimes dance as a recreation, more often to show that they are still spry and active. If they have kept up these terpsichorean exercises from earlier life, moderate dancing will do them no harm if they stop as soon as dyspnea, palpitation or fatigue sets in. However, if one has not danced for years, the exertion may be speedily fatal.

**An Invitation to A. M. A. Members.**—The American Medical Association meet this year is at Detroit, near what is claimed the greatest mineral health resort in the world. Members should avail themselves of the opportunity to make a run of twenty miles by trolley to investigate this claim. If true, would it not be better for American physicians to have the information than to send their patronage to some foreign resort of doubtful standard? Should we as Americans consider everything in

America as below standard? Certainly not. Let the battle cry be, "America first."

It is also claimed that Mt. Clemens is better known in foreign countries than in this, and as bathing is a pleasant recreation, a part of one's vacation could be most profitably spent in that way. Dr. Shotwell of The Colonial, Mt. Clemens, extends to all members of the A. M. A. the compliments of the baths during their stay.

**Iodized Phenol Applications in Diphtheria Carriers.**—Ott and Roy of New Orleans, (*Journal A. M. A.*, March 11, 1916) recommend applications of iodized phenol (N. F.) to the tonsils, uvula and posterior pharyngeal walls by means of a simple swab every 48 hours until negative cultures are obtained. The solution consists of carbolic acid 60 parts, iodine crystals 20 parts and glycerine 20 parts. Care must be taken to confine the application to the designated areas.

The results in a number of cases showed that 35 per cent were negative after one application, 29 per cent after two, 12 per cent after three and 18 per cent after five or six applications. Cultures were made just prior to the treatment.

#### Annual Meeting of the American Medical Editors' Association.

The annual meeting of this Association will be held at the McAlpin Hotel, New York City, on October 25th and 26th.

A most interesting programme is in course of preparation and the local committee composed of the following members is an assurance of a successful convention.

Dr. Thomas L. Stedman (*Editor Med. Record*), Chairman.

Dr. R. H. Sayre (*New York Med. Journal*).

Dr. Brooks H. Wells (*Editor, Amer. Jour. of Obstetrics*).

Dr. Frank C. Lewis (*International Jour. of Surgery*).

Dr. Ira S. Wile (*AMERICAN MEDICINE*).

The officers of the association for 1915 and 1916 are as follows:

Dr. Edward C. Register, President.

(*Charlotte Med. Journal*, Charlotte, N. C.).

Dr. W. A. Jones, 1st Vice-President.

(*Journal Lancet*, Minneapolis, Minn.).

Dr. G. M. Piersol, 2nd Vice-President.

(*American Jour. Med. Sciences*, Philadelphia, Pa.).

Dr. J. McDonald, Jr., Secretary and Treasurer.

(*American Jour. of Surgery*, New York).

#### EXECUTIVE COMMITTEE.

Dr. C. F. Taylor (*Medical World*, Philadelphia, Pa.).

Dr. John C. MacEvitt (*N. Y. State Jour. of Medicine*, New York).

Dr. A. S. Burdick (*Amer. Jour. of Clin. Med.*, Chicago, Ill.).

Dr. Joseph MacDonald, Jr. (*Amer. Jour. of Surgery*, New York).

The meeting on October 25th and 26th, will

be devoted exclusively to problems of a strictly journalistic nature, which will be of importance and interest to every editor and publisher of a medical journal. Among the papers to be presented are the following:

"Editorial Control," "The Editor's Prerogative in Editing Original Articles," "Book Reviews in Medical Journal," "Problems of the Subscription Department," "The Relationship Between Medical Journals of the Day," "The Up-Lift in Medical Journalism," "The Influence of the Medical Press and Profession in Public Affairs," "The Rights of an Author in the Disposition of his Contribution," etc.

**Dr. Rogers Honored.**—The American Orthopedic Association announces the appointment of Dr. Mark H. Rogers, Boston, as editor of *The American Journal of Orthopedic Surgery*, the only periodical in the English language devoted to Orthopedics. This journal, which has now completed 13 volumes as a quarterly publication, will henceforth be issued monthly, the first number in the new form being that of January, 1916.

The office of publication has been transferred from Philadelphia to Ernest Gregory, 126 Massachusetts Ave., Boston. The subscription price is \$4.00 per year.

**Reorganization of Scientific Departments.**—It is interesting to note the way the large manufacturers of pharmaceuticals are increasing the equipment and facilities of their scientific departments and raising their efficiency. Much satisfaction is felt by the profession at this because of the influence that the large pharmaceutical houses, with their unlimited resources and splendid opportunities, are certain to have on chemical and therapeutic progress. Undoubtedly the conditions created by the European War have placed new obligations on the large drug firms who are alive to their responsibilities to scientific medicine, and it is gratifying to note the promptness with which steps are being taken to meet them.

Among the pharmaceutical manufacturers who have announced changes or reorganizations of their scientific departments, is the well known firm of McKesson and Robbins. This company's laboratory has made many important contributions to chemical and therapeutic progress and its increased activity promises much for the future. It is announced that the laboratory and manufacturing department will continue in charge of Mr. E. H. Gane as chemical director, with Dr. H. E. Bates as medical director. Both of these gentlemen are well known for their accomplishments and fortunate indeed is the firm that can command their services. Mr. Gane has won an enviable reputation as an executive, and his many friends speak eloquently of his personal attributes. Dr. Bates comes to this new position eminently qualified to meet its exacting requirements and those who know his ability and personal talents are confident of the success he will win. The McKesson and Robbins scientific department has a new era of achievement before it.

# American Medicine

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**Independence Day.**—Great advances are constantly being made in the prevention of accidents. No better example of the fruitful results of a nationwide campaign is to be found than in the altered statistics of Fourth of July casualties. *The Journal of the American Medical Association*, which inaugurated this very meritorious campaign, for fourteen years has been compiling definite statistical information secured from reliable sources, with reference to the deaths and injuries accompanying the celebration of the Fourth of July. For the past eight years public sentiment has slowly been created in opposition to the in-human practices, smacking of barbarism, attendant upon the joyous celebration of a national holiday. All credit is due to the initiative of this organ of the American Medical Association for whatever results have thus been achieved.

No longer is Independence Day represented as an orgy in death dealing contrivances. Wise laws and sane regulations have developed throughout the country. The patriotic motive underlying the festival is thoroughly recognized and its application by celebrants is now made in the form of pageants, parades, public exercises, drills, competitions, picnics, musical festivals and other enlightened forms of recreational and educational activities.

In 1903, 417 cases of tetanus were reported due to Fourth of July activities. In

1908 the number had fallen to 76, while in 1915 the lone State of Maine reported a single death from tetanus. These figures are noteworthy because the statistics are more complete and more accurate than in former years. Fireworks themselves have not been the responsible factor for tetanus, though deaths have been due to premature explosions of set pieces or giant firecrackers and fatal burns have resulted from fireworks too frequently regarded as harmless. Blank cartridges and pistols must bear the odium as the chief element in conveying tetanus. The total number of deaths and accidents on the Fourth of July decreased from 5,177 in 1905 to 1,165 in 1915.

Another Independence Day is at hand. The spirit of patriotism is more assertive than for decades past. It is manifest in the recognition of the place of this nation in the councils of the world. The great feeling of internationalism is evolving. Every emotion that may be affected by a sense of national existence has been intensified. A truly national spirit is becoming crystallized, and it is probable that the enthusiasm of 1916 will seek vigorous expression in the Fourth of July festivities. It is to be hoped, however, that in the desire for the expression of a deeper patriotism, sanity will not give way to riot, and death dealing devices will not again supplant the more rational and modern modes of recog-

nizing the patriotic holiday and doing honor to its meaning.

**The spirit of Americanism** too often vents itself in impulsiveness and with carelessness. The responsibility for the prevention of unnecessary casualties clearly rests upon municipalities. Methods of celebration are subject to ordinances and regulations. The death of the thoughtless or indifferent, the burning of the youthful, the careless, and the ignorant, the maiming of the over-enthusiastic and the negligent may all be obviated if adequate restrictive enactments are made and then strictly enforced. The giant cracker, the torpedoes and other combustible or explosive preparations are not to be entrusted to untrained hands. Let there be fireworks and plenty of them, but let them be under municipal control and in the hands of those expert in handling them. The Fourth of July must be removed from the category of battles, taking their casualties from among the youths and maidens of the land, and robbing the country of the power, energy, and possibilities of a full regiment of young, loyal, enthusiastic human beings.

In 1915 the 332 deaths and accidents in New York State and the 299 casualties in Pennsylvania on this single day represent a frightful toll to patriotism. It is more patriotic to teach citizens how to live for their country than merely to inspire them with a willingness to die for it. To permit a single unnecessary death in a national celebration is unpatriotic. It is a reflection upon our national conscience which thus far has not placed a proper valuation upon the worth of a growing citizenship.

The distant roar of battle, the frightful cannonade, the shrill shrieking of shells

hurtling through the air find dull echoes on our shores. The spirit of peace pervades the inmost consciences of our citizenship, though the motives which actuated our forefathers find their counterpart in the feelings of all true Americans. In the war for national independence and in the war for national solidarity, multitudes were sacrificed in behalf of the highest principles. Today such sacrifices may not be imminent but the consciousness of possible duties to be performed should intensify our emotions and give rise to a greater understanding and realization of what this Government means and how it best may lead the concert of nations in singing an anthem of everlasting peace.

In the celebration of Fourth of July during this year new notes may be sounded. A pageant of patriotism, rolling from coast to coast, bearing a vibrant message of national unity, should not have as its accompaniment the doleful notes of the Death March, nor the wails and groans of the injured. It should carry merry sounds of laughter, of joyous hearts, of earnest national enthusiasm, of consecrated hope and confidence in the future welfare of the United States.

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**Infant Mortality.**—"Infant mortality is the most sensitive index we possess of social welfare and of sanitary administration, especially under urban conditions." This criterion of Sir Arthur Newsholme is very significant in discussing the infant mortality of this country. Of the 2,500,000 children born yearly in this country, approximately 300,000 die before the first birthday is reached!

A recent statistical report on infant mortality in cities of the United States issued

by the New York Milk Committee presents some significant facts. Of 27 cities of over 200,000 population 10 cities in the West and 4 in the East had an infant mortality rate below 100. This striking difference between the West and the East is further indicated by the following facts. Ogden, Utah; La Crosse, Wisconsin; and Omaha, Nebraska, had an infant mortality below 50. Seattle, Portland, Oregon; Berkeley, San Diego, and Madison, Wisconsin, had a rate below 50 and 60, while Los Angeles; Salt Lake City; Fort Wayne; Springfield, Ohio; Lincoln, Nebraska; Oshkosh; Jamestown, New York; Waltham; Battle Creek; Montclair, and Sioux Falls had an infant mortality rate between 60 and 70.

During 1915 Omaha, Nebraska, possessed the lowest infant mortality rate, 47.1., for cities with over 100,000 population, while Nashville, Tennessee, had the highest rate for this class, 182.3. Of cities with 50,000 to 100,000, Salt Lake City had the lowest rate, 62.1 and Passaic, New Jersey, the highest 193.5. For cities under 50,000 population, La Crosse had the lowest rate, 30.6 and Montgomery, Alabama, the highest 185.1. Apparently the West for a variety of reasons presents an index more satisfactory than the East or South in so far as Newsholme's index is accepted.

The New York Milk Committee states "no community with an infant mortality of over 50 can claim that its babies are getting a square deal." The fact that the infant mortality rate in 3 cities of the country is below 50 indicates that this is an achievable figure. Passaic with a rate of 193.5; Montgomery, Alabama, 185.1; Grand Rapids, 182.3; Perth Amboy, 176.6; Morristown, Pennsylvania, 166.5; Wilmington, North Carolina, 153.3; Nashville, Tennessee, 182.3; Reading, Pennsylvania, 151.8, have

serious problems before them in order to secure a reduction of their appalling infant mortality rates to reasonable standards.

The cause of typhoid fever is well known and municipalities are making large expenditures for the relief of the conditions hitherto causative of typhoid epidemics. As a result, the typhoid mortality rate throughout the country is on the decline. The reduction of the infant mortality rate similarly requires the rational expenditure of public funds for the protection of milk and water supplies, the control of the scourge of flies, the education of parents, the relief of industrial conditions, the promotion of social conditions to insure better housing, and finally the betterment of economic conditions to make possible higher wages.

**The control of the infant mortality rate** is within the power of any municipality. Its failure to recognize this responsibility by the practical application of modern sanitary methods, regardless of cost, stamps it as negligent or indifferent to the profound social importance of preventing the wastage of infant lives. The summer season presents a natural point of departure for instituting the changes necessary to insure a greater decline in infant mortality so that another year will show a larger number of cities in this country with a rate of below 50. Lack of funds cannot be accepted as satisfactory explanation for abnormal mortality statistics. Lack of judgment is responsible for lack of funds. Municipalities do not offer this as a justifiable or apologetic excuse.

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**Nasal Obstruction.**—That obstructive breathing hampers the ordinary processes of mentality has long been recognized. The

benefits of removing adenoids and hypertrophied tonsils for correcting intra-nasal deformities are acknowledged by those interested in the welfare of school children. The interference with educational processes is not merely due to devitalizing influences from limitations in breathing but in part from the distracting influences arising from nasal obstruction. Arnold (*The Psychological Clinic*, January 15, 1915) called attention to the fact that obstructive breathing interferes with the memorizing of verbal matter. With the immature children the loss of memorizing power is probably due as much to the distraction as to the interference with breathing.

If it be true, as apparently has been demonstrated, that nasal obstruction from various causes serves to hinder the assimilation of new matter as presented and may actually be vital in non-promotion, it is of immense educational importance that such defects and obstructions be removed.

The vacation period is now at hand. It presents a splendid opportunity for building up the health and welfare of school children so that when the new term begins in September they will be physically fit—or possibly it would be better to say, physically more fit—to participate in school work without sacrifice of health and without being placed at an educational disadvantage.

In an examination of one-third of the school children of New York City, for example, in 1913, 23,893 cases of defective nasal breathing were reported and 30,191 cases of hypertrophied tonsils. Possibly 50 per cent of these conditions are remedied during the year to the great advantage of the children.

It would seem that earnest medical men should take advantage of the importance of physical defects to impress parents

with the necessity for securing adequate remedial attention. Systems of medical inspection which are not followed up, to secure the correction of the defects noted are merely informative in character and build up columns of statistics, but do not serve to the practical advantage of the public health or the educational system. If it were possible for physicians to concentrate their efforts in this direction during the summer months with a view to securing relief from nasal obstruction, the removal of this single handicap would yield a tremendous physical and mental return to the community. Obviously, correcting this single defect will not restore children to their full potential educability. It illustrates, however, the advantage to be derived from a single minded campaign for the removal of one type of devitalizing physical defect.

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**Feeble-Mindedness.**—The basis for the diagnosis of feeble-mindedness apparently is shifting. The original criterion was more or less social rather than biological. The capacity to perform duties as a member of society in the position of life to which one is born is scarcely an adequate determinant of the level of mentality. It is indefinite and must necessarily vary as an index of mind power in different communities.

Pintner and Paterson (*Journal of Criminal Law and Criminology*, May, 1916) call attention to the importance of a psychological basis for the diagnosis of feeble-mindedness. The Binet-Simon Scale has not been satisfactory as a guide and through its use, particularly by amateurs, the percentage of feeble-mindedness in communities has been placed at figures unseemly high and of doubtful credibility.

The retardation of three years is at one

time regarded as diagnostic of feeble-mindedness and then the standard is shifted so that retardation of two years below the age of nine and three years retardation above that age is deemed more reliable, while still other workers place faith upon retardation of three years below the age of nine and four years above nine. These various classifications are indicative of gropings after the truth. With vague ideas as to what feeble-mindedness really is there has been a careful endeavor to develop a scale with which to simplify our diagnostic methods and insure uniformity of classification upon the definite concept of measured feeble-mindedness. As a matter of fact, the scale estimate pre-supposes the infallibility of the specific tests which themselves form arbitrary criteria.

Pintner and Paterson present as a psychological concept that "The lowest three per cent of the community at large, that is, the lowest as determined by definitely standardized mental tests, are to be called feeble-minded. Such a definition will be unambiguous and the dividing line between this and other groups will become clearer and clearer as we increase the accuracy of our measuring scales and the adequacy of our standardizations. Furthermore, if evolution is raising the degree of intelligence the three per cent at the lower end will still remain, for, whatever the degree of their intelligence may be, they will still be feeble-minded as compared with the normal."

It is obvious from this definition that the differentiation of moral defectives and psychopathic individuals is not contemplated but the feeble-mindedness is to be determined by the proving of intellectual defects.

The various figures which have been presented as indicative of the extent of feeble-mindedness among delinquents are so start-

lingly high that they are practically unbelievable. Thus far, sufficient data are not available to establish the percentage of feeble-mindedness among non-delinquents but if the percentage is as high in proportion as one would be led to believe by a study of delinquents, then, indeed, is the social organism in a serious state of mental deterioration.

Conservatively speaking, it is questionable whether the assumption of mental defectiveness for large percentages of the population is warranted by the group of tests thus far available.

**The problem of feeble-mindedness** is of immense social significance. It carries with it vital problems of heredity; important considerations in medical jurisprudence; it is linked up with delicate considerations of legislation; it creates a serious problem in education; it arouses clamor for new institutions; it increases the burdens of general taxation. In fact, today it represents an especially interesting field of investigation and research which is serving to reveal our errors in treatment and promises to afford a firm foundation for constructive remedial programs.

Feeble-mindedness is essentially a relative term and regardless of any selective series of tests its psychological mental content cannot be treated with dogmatic absolutism. The suggestion of a psychological concept defining feeble-mindedness as being the mental status of the lowest 1, 2, 3, or 4 per cent of the community has much to recommend it. The important fact lies in the tentative establishment of a fixed percentage that practically will include all the real victims of feeble-mindedness in any community according to present day testing standards. The value of this suggestion can

only be determined by a large experience of relating studies of intelligence by the Binet-Simon scales or the Yerkes-Bridges scale to the theoretic diagnostic point of 3 per cent feeble-mindedness at each age.

Goddard has estimated feeble-mindedness among children at from 2 to 3 per cent. The Royal Commission on the Care and Control of the Feeble-minded made an estimate at less than one-half per cent. Retardation and feeble-mindedness are not synonymous. Pintner and Paterson pointed out in the *Journal of Educational Psychology* (April, 1915) that the Binet-Simon scale cannot be accepted at full value as applied to the deaf. Their lack of comprehension, lack of environmental experience and difficulties due to the peculiar psychology of the deaf make it impossible to secure results which in any way satisfy the observer that they form reliable data for determining the mental attitude of children thus handicapped.

The deaf child during his school life is about three years retarded as contrasted with the normal hearing child. Obviously, in diagnosing mental defectiveness among the deaf the scale would have to be shifted three years forward. Hence, a different type of scale appears to be necessary for determining the mentality of those handicapped with defective hearing. The potential mind may be thoroughly normal but with the limitations of sense impressions the possibility of development is limited. Many are thus regarded as mentally defective who are merely suffering from impaired channels of communications. This same phenomenon is to be noted among the blind, those suffering from marked speech defects and even the victims of malnutrition. If only the lowest 3 per cent of a community are to be regarded as suffering from mental defects, the field of investigation is widened and more reason-

able accuracy in diagnosis may be expected in the future.

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**The study of acidosis**—the term commonly used to describe the group of phenomena that arise when the normal alkalinity of the body is decreased—is undoubtedly one of the most fascinating in the entire realm of clinical pathology. It might well be expected that an attempt would be made to analyze the various ideas and theories presented in the masterly series of papers appearing in this issue, and from the mass of evidence at our command construct a comprehensive summary that would fairly represent the consensus of scientific opinion on the subject of acidosis. The wide variety and diversity of opinions, however, concerning the nature and origin of acidosis would make any such summary extremely difficult, if not preclude its preparation entirely, and it would seem to be far more preferable under the circumstances to leave each contribution to be interpreted by our readers in the light of their own knowledge and conception of the acidosis problem.

In considering the treatment of acidosis, however, there are one or two points which we feel should be particularly emphasized. Thus in regard to the treatment or correction of acid conditions in general, while alkalies are obviously called for, and unquestionably constitute the most appropriate and effective measure for immediate relief of the situation, there would seem to be good and sufficient reason for concluding that they should not be used indiscriminately. In other words, Crile's postulate that the body is an adaptive mechanism should be borne in mind, and lead after immediate correction of an

acidosis, to the prompt institution of measures calculated to raise the normal index of bodily alkalinity, i. e., to encourage the organism to control or neutralize its acids through its own physiologic processes. Careful regulation of the diet, the judicious use of pure water, and painstaking attention to elimination have been shown to be remarkably effective in helping the body to restore its alkalinity to a nearer normal balance. In some cases, in which the origin of the acid condition is obscure, it has been found that the use of small graduated doses of some of the acids or acid salts is followed by marked benefit, for it seems that these are able in some way to increase the bodily alkalinity. Whether this is due to actual stimulation of the alkaline output, or is only a relative condition due to the decrease of the acid secretions, notably of the gastric glands, that often follows the administration of dilute acids before meals, is not plain nor does it make much difference. A much more important fact in connection with the subject under discussion, is the converse to the foregoing, that the prolonged or excessive use of alkalies tends in certain cases to increase the acidity of the body, either by stimulating the acid secretions, or relatively by depressing the alkaline processes of the body and decreasing the alkaline output. In this connection, it should be said that this refers particularly to the use of sodium bicarbonate, potassium citrate and such alkaline salts rather than to the physiologic alkalies, for clinical tests covering extended periods seem to indicate that these latter are picked up so rapidly and unite so readily with the physiologic alkaline bases in the blood and tissues that they are completely appropriated as part of the natural store of alkali. This natural store of alkali is easily balanced by the or-

ganism, and the administration of the physiologic salts probably never leads to the development of an excess of free alkali within the body, as sometimes is the case following the employment of large and long continued doses of sodium bicarbonate. Cammidge in particular has sounded a note of warning in regard to the detrimental effect of large doses of bicarbonate of soda and says that this is "probably due to the excess of soda not used for the purpose of neutralizing circulating acids disturbing the balance existing between the bases in the tissues." It is reasonable to suppose that it is this "excess" that is responsible for the aggravation of acid conditions that we have referred to as a possible danger to be feared from the excessive or prolonged use of alkalies.

**The therapeutic use of alkalies,** valuable and essential as they have been shown to be in relieving the acid state and neutralizing the effects of acid products at the moment, calls, therefore, for no less judgment and discrimination than other potent remedies. Under no consideration should bicarbonate of soda be given in massive doses day in and day out with no other thought than to render the urine alkaline. On the contrary, the alkali or combination of alkalies used should be carefully chosen and administered with regard to each patient's condition and needs. Then as soon as the immediate result sought in each patient's case is obtained, the alkali should be decreased or stopped entirely and prompt steps taken to modify the physio-chemical processes of the body through careful regulation of the diet, the liberal use of water internally and externally, and the vigorous stimulation of the emunctories. From time to time, if desirable, alkalies may be used temporarily "to effect," or in selected cases,

when the conditions warrant and the time seems propitious, small, well diluted doses of the mineral acids or some of the acid salts may be given before meals with very beneficial results. This is a matter for the most careful study, however, and the acids should be employed only after thorough consideration of the individual patient.

This brings us up to the main or fundamental detail that should be given due and proper consideration in any comprehensive discussion of the treatment of acidosis, and this is the individualization of the patient. To this end, every patient should be investigated with the utmost care and thoroughness, and every possible means employed to determine all available information concerning the patient's metabolism, his eliminative processes, the urinary solids and acidity, etc., etc. With all the facts that can be ascertained today as a consequence of the development and simplification of numerous tests and technical procedures, the clinician may adjust his treatment to a patient's individual condition with an accuracy and precision that assure results more certain and definite than were ever before possible. Especially is this true in respect to acidosis.

At any rate the ready determination of many salient facts concerning the physicochemical processes of the body having pathologic significance and the recognition of the adaptive nature of the human mechanism leave little justification for a routine "hit or miss" treatment of the bodily disorders we group under the generic term acidosis.

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**Acidosis and Surgery.**—Rapid and uninterrupted convalescence with complete recovery is ever a source of gratification to the surgeon, and the percentage of re-

coveries from dangerous operations is increasing yearly. That we owe this diminishing surgical mortality in large degree to the painstaking researches conducted by brilliant men of medico-surgical brains is undeniable. Their conclusions within the past half-decade, supported by the cooperative findings of specialists in scientific anesthesia and gastro-enterology with emphasis on selective dietetics, show clearly that prevention of surgical shock and anesthesia acidosis by pre-operative elevation of bodily resistance and establishment of secretional alkalinity is easily within the attainment of the operating surgeon. In all fairness to American surgery this assertion must be qualified by the exclusion of such emergency conditions as fulminating appendices, typhoid perforations, Cesarean sections and like demands for prompt interference at all costs. However, it is still the insistent truth that a much larger percentage of operative recoveries than now obtains might be assured through more adequate preparation of the patient, if only in the single direction of establishing a degree of body alkalescence sufficient to counteract that most potentially dangerous condition—acidosis. And right here arises the disturbing question of the responsibility for the lives that might have been saved, not by superior surgical technic on the part of the operator, but by the initial usage of every known and available means of medical preparedness for surgical intervention. To the burden of this relatively small but none the less appalling ratio of "table mortality" to the number of operations, must be added that growing army of "recoveries" whose only prognosis is chronic invalidism with its succeeding gray days of suffering.

**Who is responsible?** Is it the surgeon who, master of his craft, with a full knowl-

edge of regional anatomy and surgical pathology and with the manipulative skill and precision of a Swiss watchmaker based upon years of practice, sees his faultless operation vitiated by his patient's inability to survive? Or is it the physician who, knowing his patient from all angles, and familiar with his physical peculiarities and idiosyncrasies fails to fortify him in every possible way against the impending operation? In justice to the physician it must be admitted that many surgical conditions develop without any manifestation until the necessity for immediate operation becomes apparent. It is also true that the average patient, afflicted with a progressive disease that will bring him eventually to operation, is so self-negligent or indifferent to his danger that he effectually blocks his physician's efforts until the surgeon, called into consultation, startles him into a conscious and reasonable attitude. Yet how often does the surgeon, confronted with the internist's diagnosis of diabetes, nephritis, chronic rheumatism or gout, all true types of acid toxemias, and menacing complications amenable to intensive alkaline treatment, fail to utilize every available hour prior to operation, and every means at his command to effect the neutralization of internal secretory acidity and thus establish a safe degree of blood alkalinity? As a matter of fact, it is not sufficiently recognized in surgical circles that high urinary acidity is a serious pre-operative symptom—with its threat of acetonuria—or that this condition can be promptly cleared up by the intelligent administration of physiologic alkali. But with common sense, backed by abundant clinical evidence demanding that an acid toxicosis be corrected by appropriate alkaline treatment before every operation involving anesthesia, will not the surgeon be

justified in delaying surgical interference for the few days necessary to the foregoing and the complete elimination of the acetone and its toxic derivatives from the circulation? Crile has placed the stamp of absurdity on the term "acidemia" by proving the blood acid only at death; and from this fact it may be that we shall in the near future accept the relation of lowered blood alkalinity and the degree of urinary acidity as a factor of prime importance in surgical prognosis. Surely the beautiful simplicity of, and the entire absence of argument against, a rigid preparatory diet of the cereals, and citrus fruits, reinforced by the continuous exhibition of available alkali with its almost certain diminution of indican and prompt establishment of body alkalinity demand this practice as routine pre-operative procedure. At any rate, inasmuch as abnormal secretional acidity seems to be a process of pathological chemistry, concomitant with a considerable proportion of the more serious diseases and aberrant conditions of the body, forced alkalescence would appear to be an essential detail of their rational treatment and prevention.

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**Post-Anesthetic Poisoning.**—The question of postoperative acidosis has come to the front in a remarkable manner during recent years. Acidosis is a condition, according to Spriggs, a well known British authority, characterized by the excretion in the urine of an excess of acid radicles. These may or may not be normally present. In the forms of acidosis most commonly met with in disease, organic acids are found which are foreign to healthy urine. A rise in the acidity of the urine is not a necessary

consequence of an excess of acid radicles; indeed, if the mechanism provided for the neutralization of acid were complete, the reaction of the urine would be unaffected, as all acids would be passed out as salts or esters. When, as commonly happens, however the alkali provided by the body is insufficient for complete neutralization, the acidity of the urine is promptly raised. Sellards considers that the essential feature of acidosis is a general impoverishment of the body in bases or in substances which generally give rise to bases. Cammidge, who is one of the highest authorities on the subject, discusses acidosis from the bases standpoint so thoroughly and clearly in the present number of *AMERICAN MEDICINE* that it will be superfluous to dilate further on this phase of the subject.

With regard to post anesthetic poisoning, a considerable number of patients prepared for operation are the subjects of acetonuria, and in these, especially among the children, vomiting is more marked after operation. Wallace and Gillespie in cases in which post anesthetic vomiting is present in an aggravated degree, support the view that acidosis is the causative factor. Several writers have suggested the administration of carbohydrate in post anesthetic poisoning, both as a prophylactic and as a method of treatment. Gillespie, to whom reference has just been made and who has made a special study of post anesthetic poisoning deals with the matter in a concise and illuminating manner in this number of *AMERICAN MEDICINE*. It may be pointed out that toxic symptoms of post anesthetic poisoning do not follow chloroform anesthesia alone, but may occur after the use of ether, ethyl chloride, or even after nitrous oxide gas, as has been recorded by Langmead. It remains true, however, that the most fre-

quent and most serious cases supervene on chloroform anesthesia.

Langmead, who also contributes a notable paper to this number, seems to think as do many other authorities, that through intestinal toxemia too great a burden is thrown upon the liver which is inadequate to sustain it, and that this is a factor, or the main factor, in the causation of delayed anesthetic poisoning. Langmead has accordingly constructed the following hypothesis: "Increasing poisons from the bowel throw a heavier and heavier burden on the defensive powers of the liver until the protection breaks down. A general toxemia then results and constitutes the attack. If during the accumulative phase of the toxins an anesthetic is administered, the attack is precipitated and enhanced."

It goes without saying that in the treatment of delayed anesthetic poisoning, prophylaxis is of the first importance. Cammidge states that the diet should be arranged with three main objects in view: (1) To limit the production of acid products of metabolism as much as possible; (2) To conserve the store of alkaline bases in the tissues and blood; and (3) to maintain the balance between these bases at or near the normal level.

There are so many papers on the subject of delayed anesthetic poisoning by authorities of international reputation in the present issue of *AMERICAN MEDICINE*, that it will therefore be supererogatory to touch further on the matter. Undoubtedly much has yet to be learned concerning acidosis in its various forms and manifestations, but progress is being made, and it may be confidently predicted that this number will mark a step forward in clearing up our knowledge on this subject that is of such momentous importance to the surgeon.

**Preventable Parasitism.**—The burden of taxation constantly grows with the development of greater humanitarian sentiment. With the more modern conception of the importance of humane treatment of the victims of psychic disease, mental degeneration and invalidism, the variety of our charitable institutions constantly increases.

In an analysis of the several classes of inmates in New York institutions subject to the visitation of the New York State Board of Charities for the year ending September 20, 1914, the following proportions were revealed among 13,158 boarders at the State's expense. Feeble-minded or idiotic 24.4 per cent, epileptics 12.4 per cent, tuberculous 5.6 per cent, blind 1.5 per cent, crippled and deformed .8 per cent, making a total of 47.7 per cent who represent practically unreclaimable human material.

In the county almshouses only 18.5 per cent were found to be able-bodied while 64.6 per cent were classified as sick or infirm. In the city and town almshouses only 24 per cent were able-bodied, while 48.9 per cent were classified as sick and infirm. These figures are exclusive of the feeble-minded, the blind, the deaf, or the epileptics.

This record would appear to be a source of rejoicing that New York State is harboring with such great care types of individuals obviously requiring institutional care. In a more serious way, however, it is a sad commentary upon the conditions, social and economic, which permit the development of so many helpless and unemployable persons. Since these institutions are supported from public funds and the burden of caring for the handicapped and unemployable falls upon the general public,

the inmates may be regarded as types of social parasites, largely involuntary in character.

Preventive medicine has a tremendous opportunity in the future for reducing the number of institutions of this character through decreasing the proportion of the population who are handicapped by blindness, deafness, epilepsy and feeble-mindedness. Sickness and infirmity will always exist and institutional care will be necessary until some system of social insurance is evolved which will give adequate provision for those unemployable by reason of advanced age, industrial disability or chronic disease disabling in its effect. The greater humanity is not to be evidenced in the growth and development of hospitals, asylums and institutions that virtually afford a more or less peaceful shelter until death overtakes the victims, but is to be revealed in a conscious endeavor to reduce to a minimum the possible candidates for such state institutions.

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#### **Autotoxicosis and Psychic Disease.**—

There is not a paper appearing in this current issue that does not supply abundant material for special editorial consideration. Had we the necessary time and space, it would be exceedingly gratifying to point out the important features of each article, but this is, of course, out of the question. There is one paper, however, which has such an important bearing on one of the most urgent problems of society that we feel it an imperative duty to call especial attention to it. We refer to Dr. Bayard Holmes' article on Dementia Praecox. While it may not be generally known, this psychic disease presents one of the gravest

questions that students of social problems and public spirited citizens have to meet. An editorial in *Everybody's Magazine* (July, 1916) shows the growing recognition of the importance of this particular mental disorder and quotes Judge Olson, Chief Justice of the Municipal Courts of Chicago to the effect that:

"The vast majority of sex crimes and of crimes of violence are perpetrated by Dementia Praecox cases, either alone or grafted on feeble-mindedness." The editorial continues:

"These persons, suffering either from Dementia Praecox alone or else suffering from Dementia Praecox plus feeble-mindedness, should be detected early in life and should be removed to hospitals, there to be either cured or else kept mercifully segregated and protected from temptation till death. Whereupon the 'vast majority' of certain crimes would disappear."

For the past eight years Dr. Holmes has been studying this disease and his various articles on the subject are generally recognized as among the most important of American contributions to medical science. The paper in this issue of AMERICAN MEDICINE represents the climax of Dr. Holmes' work, and when its significance is realized, we believe it will be seen to be epoch making. The great and far reaching benefits certain to accrue to society from the discovery of successful methods of curing and preventing Dementia Praecox cannot be overestimated. Dr. Holmes has pursued his researches with the earnestness and zeal of the true scientist, constantly seeking the object before him. His faithful devotion to the study of Dementia Praecox makes one of the finest chapters in the history of medicine in America. The conservative tone and character of his announcement of the culmination of his work are no less admirable and few great contributions to science have been more free from the personal note than this one by Holmes. Con-

servative and modest though it is, however, there can be no question of the great and far reaching possibilities he has unfolded. The world at large may not know and comprehend the blight of Dementia Praecox but our jurists, psychiatrists, social workers and practicing physicians do, and can realize what its conquest will mean in lives restored to sanity and usefulness, in the prevention of crime and in the substantial reduction of the burden public charity has found so heavy. For those who know the gravity of the problem presented by Dementia Praecox, there cannot fail to be a wealth of promise in this latest report of Dr. Holmes researches.

**Epidemic Infantile Paralysis.**—The epidemic of infantile paralysis that has developed in New York City is rapidly becoming serious. It is reported that over 550 cases have occurred with 140 deaths since January 1st. The Health Department is doing everything it possibly can to curb this distressing disease, but in spite of the most strenuous and painstaking effort the number of cases is steadily increasing. Unquestionably this is one of the most discouraging details of the situation, but it is evident that the control of infantile paralysis will never be achieved until the course and mode of infection are definitely determined. Under present conditions, therefore, no possible avenue of infection should be neglected, but until we learn the method of its transmission undoubtedly the main course to pursue when the disease is known to be prevalent is to keep young children from all public gatherings, and see that the utmost care is given to the toilet of the nose and throat. Some difference of opinion exists as to the necessity for isolating affected cases. It would seem to be desirable, however, during the febrile stage, and for a certain period thereafter. In the meantime, we can only hope for the acquirement of knowledge that will enable us to establish more definite—and successful—preventive measures.

**The Narcotic Drug Laws.**—On another page will be found a letter from the Secretary of Federation of Medical Economic Leagues that is most gratifying. We are grateful indeed for the words of commendation, and are deeply pleased if any humble expression of ours has aided in presenting the situation in its true light. We are heartily in favor of curbing the abuses connected with narcotic drugs, but we do insist that the medical profession be consulted in regard to any legislation on the subject, especially any referring to the unfortunate drug addict. As for laws restricting the use of narcotic drugs by medical men, the physicians who compose the legislative committees of our medical societies and who are the ones properly to be consulted in the making of such laws, will be found only too willing to support all reasonable regulations calculated to prevent abuses. Nowhere will be found a more earnest and sincere desire to control and punish the unscrupulous practitioner, who, ghoul-like, trades on the misfortunes of drug habitues, than among the honest, high minded men who make up the great bulk of the medical profession. Our law makers may call on such physicians for cooperation with every assurance that they will receive unselfish, unprejudiced aid in devising laws that instead of imposing needless hardships may reasonably be expected to correct the real evils of narcotic drugs.

As a matter of fact, AMERICAN MEDICINE earnestly hopes to see the medical profession take a larger and more active part in everything—legislative or social—that has any relation to the public health and public welfare. Only in this way can the profession wield the influence it is entitled to by reason of the education, training and character of its members. Only in this way can it develop the solidarity that is abso-

lutely essential to the early and satisfactory solution of the various economic and professional problems now confronting it.

That the medical profession will continue to meet its obligations to humanity and the body social with the same spirit of fidelity and self-abnegation that makes it the noblest of callings we are confident. Our faith is no less strong and abiding that the problems—economic and social—now before it will be solved sooner or later with justice, honor and credit to itself, as well as benefit to the people. It is a well known fact that the Federation of Medical Economic Leagues has done a splendid work along much needed lines of activity.

AMERICAN MEDICINE will welcome every opportunity of cooperating with the Federation in its laudable efforts to promote the best interests of the profession. A successful, prosperous medical profession constitutes the best health insurance the people can have. In aiding the attainment of these ends the Federation of Medical Economic Leagues is serving the public faithfully and well. That the Federation may win the success its efforts so evidently deserve is our earnest, heartfelt wish.

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**Home Sterilization of Water.**—The importance of securing a healthful water supply is increased during the summertime. Inhabitants of large cities who are wont to take their vacations in rural communities or in sections of the country devoted to the interest of the summer tourist are frequently negligent about their own welfare. It is impossible for individuals to possess personal information regarding the status of drinking water in ever community whose hospitality is accepted. Inasmuch as many diseases are disseminated through drinking

water which sanitarily is not potable, there there are good reasons for viewing unknown water supplies with suspicion.

It is not always possible to secure sterilized water nor is it practicable to insist upon boiled water. With a view to protecting citizens who may enter upon a summer life as campers or tourists, the Department of Health of the City of Chicago has issued instructions in its *Bulletin*, May 27, 1916, for the protection of the water supply. Recognizing the advantages of calcium hypochlorite for the sterilization of water supplies, the Chicago Health Department Laboratory has prepared tablets in glass vials, each tablet containing 20 to 30 milligrams of available chlorine. The directions are given by the department as follows:

Dissolve one tablet by crushing between the fingers in one quart of water in an ordinary mason jar, which should be sealed with an air tight cap. The jar is then shaken, contents allowed to settle, and should be stored in a cool, dark place. This is the stock solution and under average conditions will last about one week, after which it should be renewed.

To prepare water for drinking, take one teaspoonful of the clear stock solution, avoiding the sediment, to one eight-ounce glass of drinking water; allow it to stand for 15 minutes, when it is ready for drinking and will be safe. If it is suspected that the water is heavily polluted, two teaspoonfuls of the stock solution should be used to each eight-ounce glass of water. If it is desired to make up a daily supply, ready for use, it can be done by adding four teaspoons of the stock solution to each quart of water.

While all this procedure may be inconvenient for the person suffering acutely from thirst, the slight delay involved may be repaid by freedom from water borne disease. The initiative of the Chicago Department of Health is commendable and should receive warmest approbation and the sincere flattery of imitation.

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**The Cause of Typhus Fever.**—The cause of typhus fever has been under careful investigation for comparatively few years. Anderson and Goldberger had succeeded in proving the identity of Brill's dis-

ease and tabardillo and an impetus thus was given to the study of micro-biology of typhus fever. In 1914 Plotz isolated by anaerobic culture a short bacillus which he called *bacillus typhi exanthematici* to indicate its causal character. In the *Journal of Laboratory and Clinical Medicine* (May, 1916) Zinsser in an editorial points out that final judgment as to its place and etiology must await results obtained in the work now being carried on by various investigators in Europe and other places.

The etiological significance of the bacillus, discovered by Plotz, has received further corroboration in a brief preliminary communication by Olitsky, Denzer and Husk (*J. A. M. A.*, May 27, 1916). Working in Matehuala, they were able to isolate an organism which, morphologically and culturally, possessed characteristics identical with the *bacillus typhi exanthematici*. They were also able to confirm the fact that *pediculi vestimenti* are factors in the spread of the disease by securing the same organism in cultures made from lice taken from the clothing of typhus fever patients. While their studies were not completed, owing to the enforced sudden termination of their work, the corroborative value of their report is none the less valuable.

Thus far the organism has not been successfully utilized for prophylactic vaccination. This failure to immunize is not conclusive evidence against its etiological importance. Considerable caution is necessary in arriving at a definite conclusion because it is only recently that Lustgarten's bacillus was hailed as the cause of syphilis and similarly other organisms were given credit or discredit as causal factors in the development of diseases for which time showed they possessed no responsibility.

It must be conceded, however, at the present time that there is every probability that the organism described by Plotz is to be regarded as the organism causing typhus fever. It is to be hoped that the reporting of experiments at present under way will establish this fact beyond possibility of contravention so that greater efforts may be applied in procuring a vaccine capable of curing typhus, and what is more important, an immunizing agent which will lessen the danger from this devastating pestilence born of filth. At the present time the destruction of lice and the protection of the typhus pa-

tient from lousiness are efficient prophylactic agencies. Active or passive immunization must be regarded as more certain and certainly a desirable supplemental means of eliminating this disease from the category of scourging epidemics.

**Are Cosmetics Drugs?**—The free activity of the summertime together with the natural intensity of heat and moisture are productive of vigorous action on the part of the skin. Its excretory activity is manifoldly increased and it assumes a large part of the burden which otherwise would be thrown upon the kidneys or lungs. Breathing through the skin is of particular importance during the summertime. Hence, it is necessary that the vital process cared for by the derma should not be hampered by restrictive clothing or overweight apparel, nor indeed by the clogging of the pores by the undue use of cosmetics.

The various laws seeking to ensure pure foods and drugs fail to take cognizance of the preparations known as cosmetics unless the labels or the literature accompanying the product make claims "for the cure, mitigation, or prevention of disease either of man or other animals." In the last analysis a pure food or drug law is vital because it seeks to secure commercial honesty. It aims to protect against exploitation of the innocent public at the expense of health or money.

The mere use of cosmetics is not to be attacked on esthetic grounds but it is timely that their relation to health be understood. Hair washes, hair tonics, complexion powders, freckle lotions, face enamels, toilet waters and similar beautifiers should not be of such a character as to impair the usefulness of the skin nor to mar its beauty.

The Board of Agriculture of Ohio in 1915 pointed out numerous proprietary preparations concerning which there was misrepresentation and exploitation, but more particularly which contained medicaments capable of producing local disease. To illustrate one type, an eye brightener of salt and boric acid selling for 50 cents cost one-half cent to manufacture. Alum and epsom salts at a cost of one-third of a cent can hardly possess sufficient value as a face

lotion to warrant the extortionate charge of 75 cents. A depilatory containing sufficient barium sulphide to remove the skin should not be salable at any price. More dangerous is a hair tonic containing 48 per cent of wood alcohol. Such constituents as lead carbonate, silver nitrate, bichloride of mercury, bismuth subnitrate, aniline dyes are hardly to be regarded as safe for external use, though at present they are beyond the pale of protective legislation.

To be sure, soap and borax cannot be honestly claimed to be a specific for the removal of blackheads nor indeed is epsom salts a satisfactory local application for the removal of wrinkles. Frauds of this type are not to be condoned. In 1915 La Wall investigated so-called rice powders. The main constituents were found to be corn starch, zinc oxide, chalk, and talc.

Summertime finds the beauty washes, face powders and enamels, not to mention the rouge and the lip sticks, playing an active part in beautifying a large part of the feminine population who may or may not require such artificial enhancement. It is proper that the dishonest manufacturer should be prevented from mulcting the feminine population in this outrageous manner. The commercial aspect, however, which involves fifty millions of dollars per annum for cosmetic preparations, is less vital than the damage ensuing from the use of poisonous substances in the guise of beautifiers. Lead poisoning, neuritis, dermatitis, acne, argyria and numerous types of local or systemic poisonings have been reported as due to the use of harmful toilet preparations. Possibly the laws with reference to drugs should be extended so as to include the cosmetic preparations. A bit of local color so to speak may be attractive but red cheeks are at times the evidence of hectic conditions.

The health and dermal welfare of the users are of profound importance to which attention has been called in the *Public Health Report*, February, 1916, by Martin I. Wilbert, whose conservative advice should represent at least the first step in bringing cosmetics under the control of the pure drug act. He states, "to prevent serious intoxications and to preclude obvious deception and fraud, cosmetics should be classed as drugs and proprietary prepara-

tions sold as cosmetics should be required to state on the label the name of any poisonous ingredient that may be contained therein."

**Antiseptics from the Sea.**—The editor of the *Medical Press and Circular* tells of a novel and practicable innovation in the hospital-ship service made necessary by the unparalleled experience in the treatment and transport of sick and wounded soldiers.

An interesting apparatus has been installed on the "Aquitania," by Dakin. It consists of an electrolytic cell and a heavy reversing switch capable of carrying up to 100 amperes and some insulated cable. The total cost is less than \$250.

The cell stands on a rubber mat and is arranged so that its contents can be poured out easily. It is filled with cold sea-water and a current of 60-75 amperes at 110 volts is turned on. In five minutes an effective two *pro mille* hypochlorite solution is obtained at a cost of six cents per 100 gallons. This solution is effectively used as a sterilizer of drinking water (1 part chloride to the million) and as an antiseptic for wounds.

In the butcher's department its value was soon evident, in the laundry the solution was used for soaking undyed cotton and linen goods. It was added to the water in the ship's swimming pool in the proportion of 1 part to 2,000,000 and reduced the bacteria 90%.

Electrolytic hypochlorite appears to be a most useful and inexpensive allround hygienic measure and its utility is not limited to the matters mentioned above. In fact the replacing of the well-known disinfectants was so great that the whole cost of the outfit was saved in the course of a single trip of three weeks.

#### **Estimate of Sickness and Its Cost Among the 33,500,000 Occupied Males and Females in the United States 1910.—**

Estimated number of cases of sickness, on the German basis of 40 per cent of the number of persons exposed to risk, 13,400,000; estimated number of days of sickness on the German basis of 8.5 days per person per annum, 284,750,000; estimated loss in wages at an average of \$1.50 per day for

6-7 of the 284,750,000 days, \$355,107,-145.00; estimated medical cost of sickness at \$1 per day for 284,750,000 days, \$284,-750,000.00; estimated economic loss at 50 cents per day for 6-7 of the 284,750,000 days, \$122,035,715.00; total social and economic cost of sickness per annum, \$772,892,860.00; estimated possible economic savings in the health of individual workers on the basis of 25 per cent reduction per annum, \$193,223,215.00.

While the above figures are but estimates, it is nevertheless true that an enormous economic loss might be prevented. This saving will increase as rapidly as working conditions are improved, and warrants the expenditure of large sums of money and much effort in reducing the amount of sickness and death due to industrial accidents and occupational diseases.

This justifies the maxim that "Public Health is Purchasable."—*Boston Monthly Health Bulletin*.

The value of publicity is gradually being recognized by progressive state officials. The direction of public attention to specific medico-social problems possesses a value readily appreciated by those believing in the power of the press. The March edition of the *New York State Health News*, for example, is devoted to the discussion of cancer—its nature, prevalence and treatment.

The general contributions are by authoritative writers whose ability to write for the laity is as recognizable as is their scientific attainment. The general service of such an issue in awakening the population to the seriousness of cancer, the importance of early diagnosis and prompt and adequate treatment cannot be estimated in dollars and cents.

Cautioning the public against malicious quackery it protects the citizenry from exploitation and avoids the waste of precious time and the possibility of cure is prevented through experimentation with alleged cancer cures and unscrupulous charlatans. The supreme importance of early diagnosis and prompt treatment is everywhere accentuated. Publications of this character are to be encouraged so that the public may become cognizant of the true facts regarding cancer and similar diseases which take such high toll in mortality.



## DIABETIC ACIDOSIS.

BY

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Acidosis may be defined as a condition in which there is an accumulation of acid products of metabolism in the body owing to an excessive production, or to defective elimination, or both together. It is now generally agreed that the clinical symptoms of acidosis are not dependent upon any specific toxic properties possessed by these metabolic products, but arise from the impoverishment of the body in bases that occurs as a result of their acid character. Considered from the standpoint of a deficiency of bases the term acidosis may be extended to include conditions in which there is an excessive primary loss of bases, or an inadequate absorption of base-forming substances through the intestinal mucosa to meet the ordinary requirements of the body. The possible causes of an absolute or relative acidosis are consequently numerous and a more or less marked degree is met with in a large variety of conditions, including diabetes mellitus, starvation, cyclic and hysterical vomiting, psychoses, cancer, pregnancy, retention of the placenta or fetus, uremia, fevers, infantile marasmus, various gastro-intestinal disorders, Asiatic cholera, poisoning with

various drugs such as the heavy metals, atropin, morphin, antipyrin, phlorhizin, and after chloroform and ether anesthesia, etc. In some disorders the acidosis is of a slight and transitory character, constituting a relatively insignificant feature of the clinical picture, but in others it assumes the dominant role and is often the determining factor in a fatal issue of the disease. The latter is the case with diabetes mellitus, particularly when unsuitable methods of treatment have been followed. As my personal experience has been mainly with the acidosis that arises in association with defects in carbohydrate metabolism I can devote my contribution most profitably to that aspect of the question, and especially to the more recent observations I have made.

The acidosis of diabetes mellitus is pre-eminently of the type which results from an abnormal formation of acid products arising through defects of metabolism, although in the later stages of some cases, and occasionally early in the disease in others, the accumulation may be accentuated by imperfect elimination. The nature of the acid bodies formed, and the means by which they may be detected and estimated, have been the subject of extensive research, but comparatively little attention appears to have been devoted to the character of the base exhaustion of the tissues that results and the effects it may produce on their functions. It seems probable, however,

that the elucidation of this problem may help to account for the cause of death in some cases of acidosis that do not develop typical coma and explain various phenomena of the comatose state which have not been accounted for hitherto. As observations on animals in a condition of artificially induced acidosis may not give results that are applicable to man and the analysis of the tissues of the human subject for bases at various stages of acidosis is impracticable, one is obliged to approach the subject indirectly by investigating the urine, for it is probable that by comparing the data given by regular estimations of the bases in a series of cases where acidosis is likely to supervene, and has been established, some indication of the extent and nature of the base exhaustion under different circumstances will be obtained.

Very few complete quantitative analyses of the urine for bases appear to have been made in acidosis and diabetic coma. So far as they go they suggest that all the available bases are drawn upon, but not to a proportional degree, the average relations existing in normal urine being more or less markedly disturbed. The observations I have been able to make tend to confirm this. Taking the five bases, sodium, potassium, calcium, magnesium, and ammonia, it would seem that, as a rule, the rise in the excretion of potassium is greater than the increase in the output of sodium, a still greater proportional increase is found in the loss of calcium and magnesium, while the output of ammonia is often, but not always, the highest of all, both relatively and absolutely. Owing to the difficulty of readily estimating sodium and potassium my attention has been devoted chiefly to determinations of calcium, magnesium, and ammonia, which have been examined for

quantitatively in all my cases as a routine for the past two years or more. When the curves of excretion of these substances are plotted out in the manner shown in the accompanying charts their relations are readily seen and they may be compared with the output of acetone bodies (acetone and aceto-acetic acid), oxybutyric acid, etc. The first example (Fig. 1) was a case of mild glycosuria in which 12 grams of sugar were passed on a diet containing 75 grams of carbohydrate, but no acetone bodies or oxybutyric acid could be found. As the carbohydrate content of the diet was gradually reduced the sugar diminished and eventually disappeared on the fourth day, but as there was still hyperglycemia the allowance of starchy food was further curtailed. On the fifth day traces of acetone appeared, and on the seventh day oxybutyric acid was found. The latter continued to be excreted for a few days, the quantity varying inversely with the carbohydrate content of the diet, and disappeared again on the fourteenth day, after which no trace could be discovered. The acetone bodies then also diminished and finally disappeared on the sixteenth day. Turning now to the calcium, magnesium, and ammonia excretions we find that a slight but steady increase in all three preceded the appearance of either the acetone bodies or the oxybutyric acid, their curves of excretion running fairly parallel until oxybutyric acid was found when there was a more marked rise in the calcium, a less marked rise in the magnesium, and a drop in the ammonia, the last being accounted for no doubt by the sodium bicarbonate that was given. Subsequently the calcium and magnesium excretions followed in a striking manner the variations in the output of

oxybutyric acid, but the ammonia was not similarly affected.

The majority of the cases of diabetic acidosis I have examined conform in the main to the type just described, especially in the early stages, but variations are not uncommon and it would seem that although

tissues are depleted of these bases. One of the factors influencing magnesium excretion appears to be the state of the nervous system. I have noticed a rise in the output of magnesium in association with shock, worry, mental excitement, and affections of the nervous system too fre-

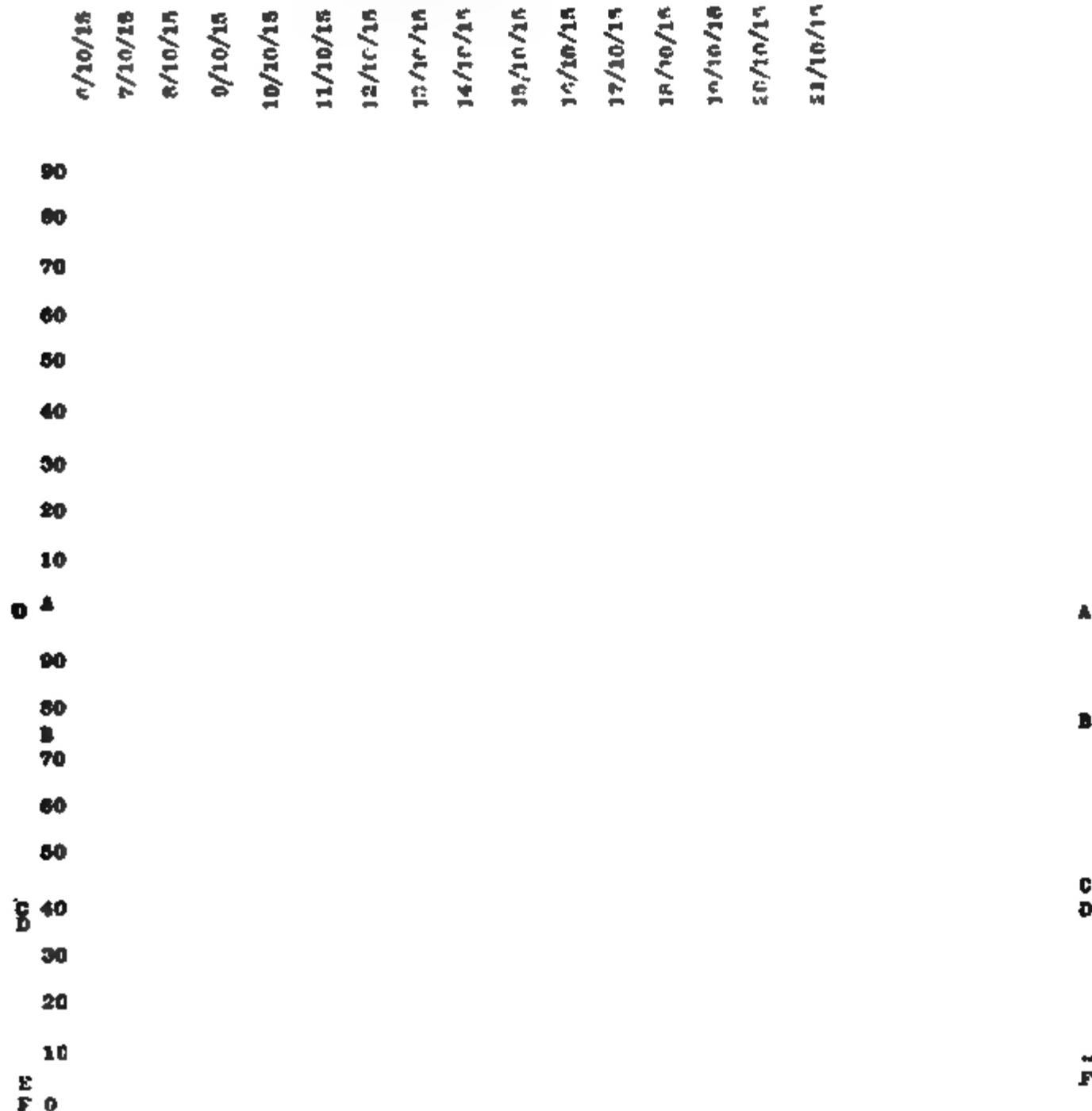


FIG. 1.

A = Oxybutyric Acid (grams  $\times$  10).  
B = Carbohydrate in Diet (grams).  
C = Calcium (grams  $\times$  100).

D = Magnesium (grams  $\times$  100).  
E = Ammonia Nitrogen (grams  $\times$  10).  
F = Acetone Bodies (grams  $\times$  10).

the excretion of calcium and magnesium is determined, as a rule, more or less directly by the extent to which oxybutyric acid, and possibly some antecedent substance, is produced, other factors exert an influence on the way in which the

excretion of calcium and magnesium is determined, as a rule, more or less directly by the extent to which oxybutyric acid, and possibly some antecedent substance, is produced, other factors exert an influence on the way in which the

(Fig. 2) illustrates this point. The patient was a typical diabetic with fairly well marked acidosis. As in the preceding case the excretion of calcium and magnesium tended to follow the output of oxybutyric acid, although there was not quite such a close and constant relationship. From the

collected and that he was very troubled and worried in consequence at the time. When the next analysis was made, a month later, the former relation between the calcium and magnesium had been reestablished and has been maintained since. A similar effect has been seen in other cases after

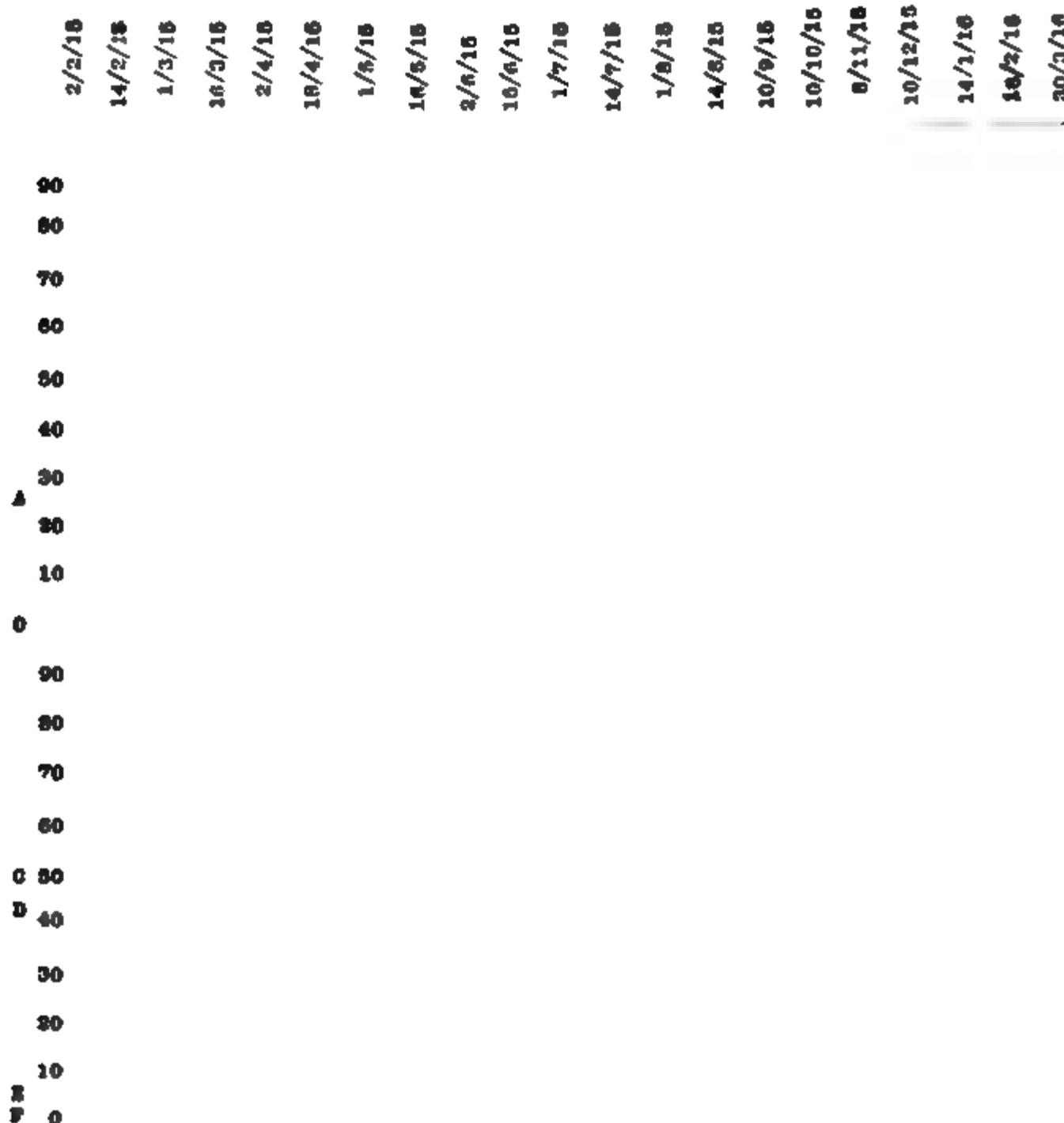


FIG. 2.

A = Oxybutyric Acid (grams  $\times$  10).  
C = Calcium (grams  $\times$  100).  
D = Magnesium (grams  $\times$  100).

E = Ammonia Nitrogen (grams  $\times$  10).  
F = Acetone Bodies (grams  $\times$  10).

beginning of February to the middle of December the calcium always exceeded the magnesium, but on the 14th of January the latter showed a sudden rise. Inquiry revealed that the patient's mother had died suddenly a week before the specimen was

cerebral hemorrhage, in association with neuritis, etc.

The "ammonia" nitrogen (true ammonia nitrogen and amino-acid nitrogen) does not appear to be directly related to the excretion of oxybutyric acid in the

same way as the calcium and magnesium. In most of my cases the ammonia curve has corresponded more closely to the curve representing the output of acetone bodies (Fig. 3), but allowance has to be made for the fact that sodium bicarbonate was given in all instances as soon as aceto-acetic acid

seem that the administration of sodium bicarbonate affects the ammonia output much more than it influences the excretion of calcium and magnesium.

The course taken when the acidosis continues to progress appears to be influenced largely by the treatment and particularly by

2/5/16	2/6/16	2/7/16	2/8/16	2/9/16	2/10/16	2/11/16	2/12/16	2/13/16	2/14/16	2/15/16	2/16/16
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a

A

b

B

c

C

A = Oxybutyric Acid (grams  $\times$  10).  
 C = Calcium (grams  $\times$  100).  
 D = Magnesium (grams  $\times$  100).

FIG. 3.

E = Ammonia Nitrogen (grams  $\times$  10).  
 F = Acetone Bodies (grams  $\times$  10).

was detected in the urine and was continued so long as a reaction was obtained. This accounts for the ammonia being lower than might be expected from the evident degree of acidosis and the height of the calcium and magnesium excretions, for it would

the diet, but there are also differences that are probably due to fundamental variations in the type of disease. In all the fatal cases I have observed there has been a progressive increase in the excretion of calcium and magnesium, irrespective of the output

of ammonia and uninfluenced by the administration of sodium bicarbonate, until a comparatively short, but variable, period before death took place. In some cases the increase has been fairly uniform and constant until diabetic coma supervened and death occurred with typical symptoms of

weakness, and finally death from heart failure. In the case shown in Chart 4, for example, where the base excretion was of the first type, coma developed three days after the last analysis was made and death occurred within the week accompanied by characteristic symptoms. The other case (Chart

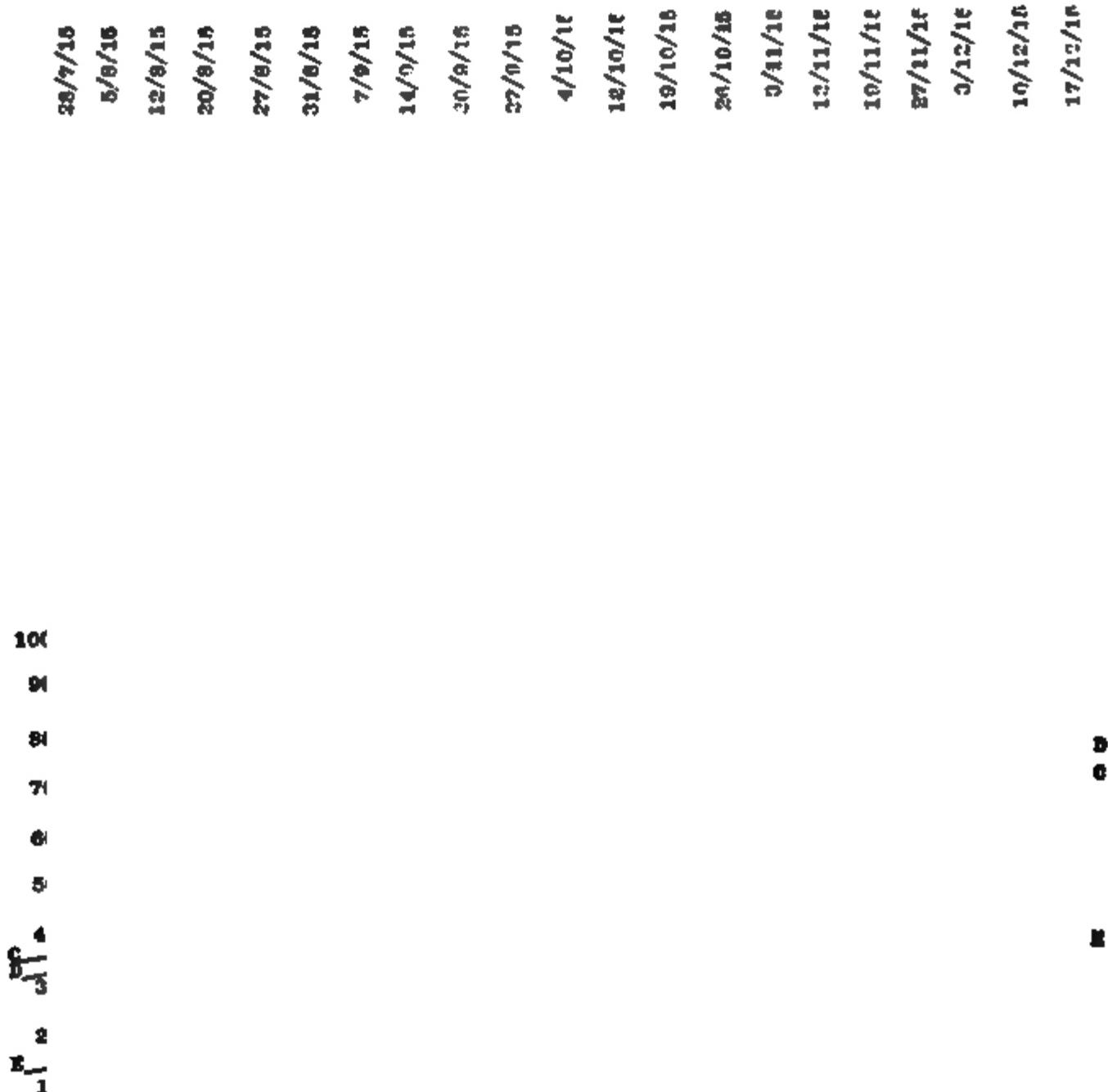


FIG. 4.

C = Calcium (grams  $\times$  100).

D = Magnesium (grams  $\times$  100).

E = Ammonia Nitrogen (grams  $\times$  10).

air-hunger etc., while in others where the excretion of bases, and particularly calcium and magnesium, has been generally more pronounced, there has been eventually a more or less rapid fall associated with increasing muscular weakness, nausea, sick-

ness, and finally death from heart failure. In the case shown in Chart 4, for example, where the base excretion was of the first type, coma developed three days after the last analysis was made and death occurred within the week accompanied by characteristic symptoms. The other case (Chart

the last analysis was made. Death took place from heart failure, following attacks of sickness, on July 4th. Unfortunately I am not able to include the oxybutyric curves for either of these cases as systematic estimations were not being made in my labor-

cause they appear to represent in a particularly striking manner the main results of the observations I have made so far in this particular direction, but some I have investigated do not conform to the types described and others show irregular varia-

30/1/1914	8/2/1914	13/2/1914	20/2/1914	27/2/1914	6/3/1914	13/3/1914	20/3/1914	27/3/1914	6/4/1914	13/4/1914	19/4/1914	26/4/1914	3/5/1914	10/5/1914	17/5/1914	25/5/1914	1/6/1914	8/6/1914	15/6/1914	24/6/1914
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FIG. 5.

C = Calcium (grams  $\times$  100).  
D = Magnesium (grams  $\times$  100).  
E = Ammonia Nitrogen (grams  $\times$  10).

atory when they were under observation, nor have I had a fatal case of diabetic acidosis under my immediate care for a long enough period to obtain satisfactory data since it became a routine procedure.

The cases quoted have been selected be-

tions for which I have not been able to find an explanation as yet. It is obvious therefore that there is much more work to be done and it is probable that further experience may lead to a revision of the tentative inferences which the results at

present available suggest. Before dealing with these it will be advisable to refer to the way in which bases are distributed in the body. Of the five available for purposes of neutralization, sodium, potassium, calcium, and magnesium are present in all the tissues and fluids, while ammonia can be formed when necessary. The first four are met with in the different tissues in various proportions, potassium for example is always more abundant in the cells than in the tissue fluids, whereas there is a relative excess of sodium in the latter; lime and magnesia are found in nearly equal proportions in the muscles, lungs, etc., but the nervous system contains an excess of magnesia relative to lime, and the reverse is found in the liver and spleen. These differences in distribution are not accidental but are intimately bound up with the functions of the various structures, a certain balance of bases being apparently necessary for each particular tissue and organ to carry out its work efficiently. Thus the rhythmic action of the heart is well known to depend upon its being supplied with a fluid containing a certain concentration and quantitative proportion of calcium and sodium, while a somewhat analogous balance between the magnesium and calcium in the nervous tissue appears to be necessary for its smooth and efficient working. Withdrawal of bases from the tissues may consequently be expected to show itself by increasing functional disturbance in the heart, nervous system, etc., etc., the exact order and nature of the symptoms depending upon the direction in which the normal balance is upset, the site of formation and character of the acid products, and the physiological importance and vascularity of the tissues. When considering this question we have to distinguish between the

basic content of the blood and the tissues. Since the hydrogen ion content of the blood can only vary within a very narrow zone of change without producing serious effects on the mechanism of respiration, it is essential for the existence of the organism that an accumulation of acids should be prevented there at all cost, consequently if the available alkalies in the blood are not sufficient to neutralize all the acid that may reach it, bases are withdrawn from the tissues for the purpose and fresh sources of alkali are tapped in the form of ammonia diverted from its normal destiny of urea formation. Ammonia formation appears to be a mechanism specially concerned with the maintenance of a normal equilibrium between the hydrogen and hydroxyl ions in the blood and it is to preserve this that it would seem to be chiefly brought into play. The condition of the blood as regards its hydroxyl ion concentration and even as regards its titratable alkalinity and carbon dioxide content, is consequently not of necessity a reliable index of the impoverishment of the tissues in bases. The same is true of the ammonia output in the urine, which varies with the ammonia content of the blood. A study of the results of my investigations suggests that the acid products of metabolism giving rise to acidosis have a selective affinity for various bases, oxybutyric acid for instance tending to combine with the heavy metals, calcium and magnesium. If this is the case the relation between the bases that normally exists in the tissues, and upon which their functional activity depends, will be more and more difficult to maintain as the acidosis progresses and larger quantities of oxybutyric acid are formed, so that ultimately a disturbance of function will result and give rise to clinical symptoms, provided that

meanwhile the effect of the acidosis on the blood has not ended the patient's existence by preventing a sufficient respiratory exchange. According to this view the character of the terminal symptoms of a progressive acidosis will depend upon the relative rate of exhaustion of the tissues in bases and the power of the body to prevent changes in the blood that would interfere with the mechanism of respiration. Two main types are therefore possible, one, which may be termed the classical type, where death occurs with air-hunger and typical coma in consequence of the blood changes and before the effect of the impoverishment of the tissues in bases has given rise to noteworthy symptoms, and the other a type where the blood changes and respiratory difficulties do not develop and death occurs as a result of functional disturbances in organs essential to life following their depletion of essential bases below a working level. The fatal cases described in a previous paragraph appear to illustrate these two types. In one (Chart 4) there was a slowly progressing loss of calcium and magnesium which continued with very little change up to the end, when coma supervened and death occurred before extreme exhaustion of the tissues in bases had time to take place, while in the other (Chart 5) the much more marked loss of calcium and magnesium brought about a comparatively rapid base exhaustion of the tissues before serious disturbance in the equilibrium of the blood occurred, the nausea (probably of central origin), the fall in blood pressure, the irregular and feeble action of the heart, with ultimate arrest, being probably attributable, in part at least, to impoverishment of the nervous system, muscles, etc., in essential metallic bases. Typical cases such as these are comparatively rare, more

or less overlapping of the two types being more common, but it has been my experience that the more completely the treatment of diabetes mellitus is based upon the results of exhaustive and systematic analysis of the urine; the less frequent does death from coma of the classical type become and the longer is the average length of life, even of cases with advanced acidosis.

Precautions against acidosis should form part of the treatment of every case of glycosuria, mild as well as severe, for it is easier to prevent than to cure. Careful regulation of the diet according to the nature and extent of the metabolic changes shown to be present by analysis is the chief means of combating the condition, treatment by drugs being, at best, only palliative. The diet should be arranged with three main objects in view (1) to limit the formation of acid products of metabolism as much as possible, (2) to conserve the store of alkaline bases in the tissues and blood, (3) to maintain the balance between these bases at, or near, the normal level. Since the formation of abnormal acid products of metabolism results primarily from a deficient supply, or the defective utilization of carbohydrate, it is obviously advisable that the intake of starchy food should be as liberal as the patient can use and as is consistent with the satisfactory control of other symptoms. In many cases the limit of utilization of carbohydrate is so low, however, that one has to rely more on regulating the food supply in other directions, and particularly by limiting the intake of protein. The oxidation of all protein material gives rise to an excess of acid-forming over base-forming elements so that the more protein used by the organism the larger is the call upon the stored bases to neutralize the excess of acids that

results, further it is well known that a protein diet, in virtue of its specific dynamic effect upon the decomposition processes of the body, increases metabolism, promotes tissue waste, and consequently augments the formation of acid products. For these reasons alone, if for no others, it is a distinct advantage that the protein intake in diabetes should be limited to an amount which will make good the nitrogenous waste of the body without leaving any appreciable excess to be used unnecessarily for other purposes. Some modern methods of treating diabetes attempt to attain this end by allowing fixed amounts of protein food, but much more satisfactory results are obtained by regulating the intake for each case by watching the effects of a gradual limitation of the protein intake on the nitrogen excretion in the urine and determining the amount which will keep the patient in nitrogenous equilibrium (see Cammidge, "The Nitrogen Balance in Diabetes Mellitus and Its Importance in Treatment," *Lancet*, Nov. 27th, 1915, p. 1187). It has also to be borne in mind that the nature of the protein, as well as the quantity, has a bearing on the question of acid production, for there is a marked difference in the possible yield of acetone bodies from different proteins, depending on their amino-acid make-up. As a rule vegetable proteins may be expected on theoretical grounds to give rise to less acetone and kindred substances than proteins of animal origin, while of the latter casein appears to be one of the least ketogenetic, and glycogenetic, of those commonly used as a food material. It is interesting to note therefore, that, as a result of clinical experience, a vegetable diet has come to be an important feature of most modern methods of treating diabetes, and that casein has been employed empirically

in recent years as the chief constituent of many "diabetic" breads and biscuits.

A vegetable diet, or at least a system of dieting that contains a large proportion of "vegetable days," has other advantages, not the least of which is the preponderance of base-forming over acid-forming elements that it furnishes. Normally the store of metallic bases in the body is chiefly derived from vegetables and fruits, and when, as in diabetic acidosis, there is a pathological excess of acids it is more than ever necessary that an adequate supply should be provided to combine with the acids and counteract the tendency to impoverishment of the tissues that would otherwise ensue. In planning the dietary for a diabetic it is consequently not sufficient to consider only the protein, fat, carbohydrate, and caloric requirements of the individual, the potential acidity and alkalinity of the various foods must be taken into account and the diet be arranged so that a suitable balance of bases shall be left. By making a selection of vegetables, and in some instances of fruits also, much may be done to preserve the natural store of alkaline bases and maintain the normal balance between them in the tissues and blood, thus preventing, or at least postponing, the onset of coma and other symptoms likely to arise from uncompensated acidosis. In order that full advantage may be taken of the potential alkalinity of a vegetable diet it is necessary that it should be taken raw as far as possible and that vegetables, etc., which cannot be taken in this way should be cooked without the use of water, since boiling in water entails a loss of from 40 to 50 per cent. of the contained mineral matter. The comparative richness of vegetables and fruits in potassium and the presence of a considerable proportion of cal-

cium and magnesium, in some, may be utilized to compensate for the loss of these three metals that occurs in many cases of diabetic acidosis, but it is often necessary to supplement the sodium they contain by sodium bicarbonate. If it is taken in keratin-coated capsules, which pass through the stomach unchanged and only dissolve on reaching the intestine, very much smaller doses than are usually prescribed will suffice and the interference with gastric digestion and the discomfort that often results from the use of a simple solution or powder can be avoided. Large doses of sodium bicarbonate are rarely necessary and are often detrimental, especially in cases of advanced acidosis. This is probably due to the excess of soda not used for the purpose of neutralizing circulating acids still further disturbing the already imperfect balance existing between the bases in the tissues. In order to preserve the balance and prevent exhaustion of the tissues in cases where diet alone is not sufficient to control the condition keratin-coated capsules containing a mixture of alkaline sodium, potassium, calcium, and magnesium salts in physiological proportions may be given in gradually increasing doses, spread as evenly as possible over the twenty-four hours, as a supplementary means.

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## A CONTRIBUTION TO THE STUDY OF ACID-INTOXICATION IN CHILDREN; CYCLIC VOMITING AND DELAYED ANESTHETIC POISONING.

BY

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Certain writers have made a distinction between acidosis and acid-intoxication, implying by the former term that acetone and possibly diacetic acid are found in the urine in abnormally large quantities; by the latter, that this excess of secretion of fat metabolisms is accompanied by the usual symptoms of diminished alkalinity of the blood. Now it is certain that both diacetic acid and acetone in appreciable amounts may be found in the urine of many children without any related symptoms, and that their mere presence is devoid of clinical significance. Moreover acid-intoxication itself or at least the group of symptoms ascribed to it—drowsiness, air hunger, thirst, restlessness, acetone in the breath and acetone and diacetic acid in the urine—can be detected in not a few conditions, either clearly marked, or more or less obscured by the disease with which it is associated. Such are—to mention only a few—pneumonia, intestinal obstruction, uremia, septic tonsillitis, and poisoning by various drugs, notably by opium. In yet other disorders it plays so prominent a part as to demand observance; among them are diabetes, the pernicious vomiting of pregnancy, acute yellow atrophy, poisoning by salicylates, cyclical vomiting and delayed anesthetic, commonly called "delayed chloroform" poisoning. The last two will form

**Bronchial Asthma and the Barometer.**  
—Baar (*Wien. klin. Wochenschr.*, Nos. 29, 30, 1914) has studied the effect of the barometer pressure upon the incidence of asthmatic attacks. He found that patients with chronic bronchial asthma always suffered more when the barometer was falling, while those who had only occasional attacks were more apt to have specially severe ones during these times. He thinks the falling atmospheric pressure may exercise some influence upon the pulmonary vagus.

the burden of this short paper, for the first of them is confined to children, whilst the last affects them much more frequently than adults.

*Cyclical Vomiting.*—(Recurrent Vomiting; Periodic Vomiting). Described first by Gee<sup>1</sup>, this condition for some time attracted much more attention in the United States and in France than in England, and was studied especially by Griffith,<sup>2</sup> Edsall,<sup>3</sup> Marfan,<sup>4</sup> and Guinon.<sup>5</sup> Later papers too numerous to mention, have followed.

It affects girls more commonly than boys, mainly between the ages of 2 and 12 years. The patient is generally of a pronounced neurotic type—imaginative, easily frightened, often exalted or depressed. Between the attacks nothing amiss is noted in the majority, though in some there may be an inability to deal with certain kinds of foods, particularly fat, and a marked distaste for them.

The attack is preceded by a period, of a few hours or days duration, of lassitude, languor, nausea, headache, anorexia, and perhaps fever. Constipation is usually present, though no history of it may be obtainable.

Once started; the vomiting is repeated and distressing, the vomit consisting first of food, then of bile-stained fluid, and finally containing, in severe cases, a little altered blood in the form of "coffee grounds." The odor of acetone is detected in the breath and in the vomit, and the latter is sometimes described by the patient as "sweet." Accompanying the vomiting is great thirst, the child asking often for water, but disliking every kind of food. Some abdominal pain and tenderness may be present, but appear to be due to the urgent retching and not to precede it. Jaundice may be noted.

Added to these symptoms are those of acid intoxication. Drowsiness and restless movements are marked and, in the severest cases, may be replaced by coma. Air hunger and sighing respirations intensify the clinical picture. The urine contains acetone, diacetic acid, and beta-oxybutyric acid, but no sugar. Albumin and hyaline or epithelial casts are sometimes found but are less constant. Holt has shown that, during an attack, there is a fall in the amount of uric acid present, and Mellanby<sup>6</sup> and others have noted the constant excretion of creatin between the attacks, an output which increases for a few days before the vomiting begins.

Partly as the result of the difficulty or impossibility of administering food and partly, no doubt, from enhanced katabolism, the child wastes rapidly, and if the illness is protracted may become emaciated. The skin becomes "doughy" and inelastic. Occasionally through the sunken, thin abdominal wall, an enlarged liver may be felt, but this objective sign is often lacking.

After a period, varying from a day or two to as long as 3 weeks, the vomiting and acid-intoxication symptoms cease as abruptly as they began, a ravenous appetite returns and the child regains weight and strength with astonishing celerity. The attacks may recur every few weeks or no more than once or twice a year, and vary greatly in their intensity. Seldom is the termination fatal; in 1912 I could find records of only 11 cases which ended in death.

*Diagnosis.*—The history of former attacks, the distinctive clinical picture, and the absence of subjective signs make the recognition of the condition easy in most circumstances. In my experience, most of the mistakes have been made by those who have been unaware of the not uncommon

incidence of this affection. When there is much cerebral irritability, *meningitis* may be suspected. The torpor, headache, vomiting and initial fever succeeded by vomiting lead to a mimicry of that disease close enough to produce confusion. The onset is too abrupt, however, for *tuberculous* meningitis, whilst the absence of distinctive physical signs, such as rigidity, Babinski's sign, squint, optic neuritis, serve to exclude meningitis in practically every case. The vomiting is more continual too, and the acid poisoning syndrome more dominant. If doubt still persist, a lumbar puncture would remove it, though this should very rarely be necessary.

Perhaps the most serious confusion which can arise in the diagnosis is with *intestinal obstruction* from any cause. With a combination of continual vomiting, constipation and abdominal tenderness, it is easy enough to see how this mistake occurs. Again the absence of local abdominal signs, beyond perhaps some slight tenderness, is of greatest significance. In a doubtful case it is scarcely necessary to state the importance of a rectal examination. Whatever may be said (I think erroneously) of many conditions, it is eminently untrue in this instance that "an abdominal exploration will do no harm." In the few cases in which I have seen a laparotomy performed during a phase of cyclical vomiting, the issue was fatal in every one. In the rare examples where the balance of evidence is evenly poised, spinal anesthesia would, no doubt, be less dangerous.

*Nervous* and *hysterical vomiting* are sometimes wrongly styled "cyclical vomiting" though their symptoms have little in common except the vomiting, and, in the case of hysterical vomiting, the wasting. The profound toxic symptoms are lacking

in both. Nervous vomiting, which also occurs in children easily over-stimulated psychically, is analogous to nervous diarrhea, and appears to be due to enhanced gastric excitability. Immediately after a meal, particularly after breakfast, the food is ejected without distress. There are no periods of freedom from symptoms alternating with others of continuous vomiting. The same is true of hysterical vomiting, in which condition the child's mental attitude and her fostering of her self-interesting symptom, suggests its origin.

There remain two conditions which so closely resemble cyclical vomiting that it is possible that they are identical. One of these is recurring "*bilious attacks*." This is the name usually given to cyclical vomiting by the parents. Whether the slighter relapses of this disease can properly be termed "*bilious attacks*" depends largely on what is understood by that somewhat unscientific term. By some it denotes bouts of vomiting following a definite indiscretion in diet and when thus used has little affinity to "cyclical vomiting." When used for recurring attacks of unexplained vomiting accompanied by toxic symptoms, it implies a condition inseparable from cyclical vomiting. The other was described by the late Eustace Smith and called by him "*Food Fever*." Under this title he recorded a series of cases of children who suffered from attacks of pyrexia accompanied by vomiting and gastro-intestinal disorder. These he attributed to an excessive ingestion of carbohydrates.

Another association is worthy of mention —migraine. A family history of migraine can be obtained in many cases of cyclical vomiting, and at puberty cyclical vomiting is not infrequently replaced by the former malady.

*Post-anesthetic Poisoning* (Commonly called Delayed Chloroform Poisoning). Under the title of "Delayed Chloroform Poisoning" the first description of this condition was from the pen of Leonard Guthrie. Little attention was paid to it for some years—indeed not until the author of the title would probably have preferred to change it to "post-anesthetic vomiting." For these toxic symptoms do not follow chloroform anesthesia alone, but may occur after the use of ether, ethyl-chloride, or even after nitrous oxide gas, as in a case recorded by the writer. It remains true, however, that the commonest and more serious cases supervene on chloroform anesthesia. The amount of anesthetic used bears no relation to the incidence of the condition, nor upon its severity. What are of more moment are the change of diet dependent upon admission to a hospital or home, the degree of starvation preceding the operation, the withholding of carbohydrates during this period, and the presence of acetonuria. R. Frew<sup>8</sup> has shown that acetone appears in excess in the urine in a large proportion of children after admission to hospital, and is ascribable, no doubt, to change of diet. We know also that mental stress, starvation, and especially deficiency of carbohydrates produce a like result. If the operation can be postponed until the wave of acetonuria has passed, if pre-operative starvation be abandoned, and carbohydrate be given for a few days, the risk from post-anesthetic poisoning is minimized.

In many cases of post-anesthetic poisoning a history of previous "cyclical vomiting" attacks can be obtained, and such an inquiry should precede any operative treatment for a child when such treatment is not immediately imperative. Such a history

will counsel suitable treatment and may avert disaster.

The *symptoms* so closely resemble those of cyclical vomiting that no special description is opportune. They are more often grave than in the latter condition, and more frequently precede a fatal issue. Jaundice is usually more considerable, the degree of toxemia often evokes an uncontrollable restlessness simulating meningitis, and convulsions may supervene. Death, which in the rare fatal cases of cyclical vomiting is postponed for weeks, may follow the initial symptoms after an interval of only a few hours. These initial symptoms themselves may succeed the anesthesia so rapidly as to merge into those of recovering consciousness, or may be postponed for a few days.

*Morbid Anatomy*.—The changes revealed by a post-mortem examination are so similar in the two conditions that they may reasonably be considered together. These amount merely to fatty degeneration in the viscera, particularly in the liver, kidneys and heart. The appearance of the liver is especially noteworthy; the organ may be canary yellow or buff colored and, in characteristic examples, differs sufficiently from the fatty liver of sepsis to make it recognizable at sight. Microscopically the degree of fatty change is found to be extreme, and generally more marked at the periphery of the lobules. The fat globules themselves are of quite extraordinary size. In addition, in delayed anesthetic poisoning, there is necrosis of the liver cells, chiefly central in position; in cyclical vomiting this central necrosis is little evident or absent. The pathological changes in the liver appear to be most nearly comparable with those of phosphorus poisoning, or with poisoning induced by tetrachlorethane, dinitrobenzol,

and trinitrotoluene, as recently described by B. H. Spilsbury.<sup>9</sup>

*Etiology.*—The causation of these conditions is still obscure. No one who has had an opportunity of observing either of them can come to any other conclusion than that they are the outcome of some form of toxemia.

In the case of cyclical vomiting the toxin or toxins are self-engendered (I do not say autolytic, though, no doubt, autolysis plays some part in the later stages of both) and, reaching the acne of the activity culminate in producing an attack. The early pyrexia, malaise and headache suggest this, whilst the incessant vomiting is probably eliminative in nature. Assuredly fatty acid-intoxication does not explain the whole symptomatology, for though the presence of this is patent, there are distinctions between the symptoms of cyclical vomiting and those of diabetic coma; the most prominent feature alone—vomiting—constitutes an important difference. Moreover the acetonuria and diaceturia do not always precede the toxemia. There must also be an explanation of the acid-intoxication.

Again, in so-called "delayed chloroform poisoning" the toxemia cannot be ascribed solely to the chloroform. It is true that Stiles and McDonald have produced similar histological changes by administering very large doses to animals, but though this may explain the relatively greater incidence of the condition after chloroform anesthesia, it fails in the face of those cases which occur after the use of minute quantities of the drug and of those which follow in the wake of anesthesia induced by ether, ethyl-chloride and nitrous oxide.

There is little doubt in my mind that the victims of delayed anesthetic poisoning car-

ry with them to the operating table the seeds of the calamity which is about to overwhelm them. The similarity between the age-incidences, the symptoms and the morbid anatomy of the two conditions here described, and the possibility of obtaining a history of previous bilious attacks in delayed anesthetic poisoning with the fatal issue resulting from anesthesia during an actual attack, suggest that the components which comprise the state of susceptibility to poisoning after anesthetics are the same as those which underlie cyclical vomiting. In other words, delayed anesthetic poisoning occurs in children who are the subjects of cyclical vomiting, potential or declared. The determining factor is possibly the damping of the metabolic fires and the weakening of protective powers which anesthesia brings, enhanced by the toxic effects of chloroform, when that is the drug employed.

What these components are and how they arise is still unsolved. Is the liver functionally normal before the toxemia arises or are the gross changes found in that organ merely the result of the toxemia, are questions still to be answered. The analogy with the effects produced by Eck's fistula certainly suggest that the symptoms are in great part due to defect of hepatic function. Does this arise at the time of the vomiting attack or anesthesia, or does it precede them? The observations of Mellanby<sup>10</sup> and of Sedgwick<sup>11</sup> favor the latter view, for, in cases of cyclical vomiting, they have shown that creatin, which normally is converted to creatinine by the liver, gradually accumulates in the urine between the attacks, reaching its maximum just before an attack is due. The course of a case of cyclical vomiting with its attacks of vomiting recurring without apparent

cause seems to imply that the poison is gradually accumulated rather than suddenly produced.

If we suppose that the liver is functionally inadequate before the attacks, we have still to explain how this inadequacy arises. Is it an inborn error, as Guthrie believes, or is it acquired? If acquired it may arise in two ways, one by some acquired defect in the liver itself, the other by too great a burden being placed upon it. The latter appears to me to be the most likely explanation; in a former communication I have suggested intestinal toxemia—that refuge of the destitute—as the cause of this undue burden in the case of cyclical vomiting. In the present state of our knowledge such a suspicion—and it can amount to little more—can be neither proved nor disproved, but it is not without foundation. Some of the stones of this foundation are the following: (1) Gastro-intestinal lesions have been found in five out of six cases examined post-mortem; (2) constipation or offensive diarrhea is a frequent precursor; (3) a marked indican reaction is commonly obtained in the urine; (4) Herter mentions cases in which he demonstrated the presence of intestinal putrefaction upon which he thought they depended; (5) Mellanby<sup>12</sup>, and Tort have isolated from the human intestine a bacillus which produces beta-amino-azoethylamine from the intestine, and Dale<sup>13</sup> and Barger have shown that this substance produces vomiting and is a very potent poison; (6) the most conspicuous changes in the liver in cyclical vomiting are found in the region of the portal circulation—in the periphery of the lobules and (7) due attention to the bowels, ensuring a daily free evacuation, will diminish and sometimes altogether prevent a recurrence of attacks.

Guided by this suspicion it may not be inopportune for the sake of clearness to reconstruct a hypothesis. It would be as follows: Increasing poisons from the bowel throw a greater and greater burden on the defensive powers of the liver until this protection breaks down. A general toxemia then results and constitutes the attack. If, during the accumulative phase of the toxins an anesthetic be administered, the attack is precipitated and enhanced. This is more particularly so in the case of chloroform because of its special toxic attributes. During the attacks not only are the intestinal toxins in action but also others arising from imperfect hepatic function-katabolites of proteids and of fatty acids (acid-intoxication). Finally autolytic poisons may play a part.

*Treatment.* (a) *Cyclical Vomiting.*—Dietetic measures appear to have little influence in preventing the attacks of true cyclical vomiting, which occur in spite of most rigorous dietetic regimes. It is scarcely necessary to say that the diet should be reviewed in order to correct the usual irregularities of over-feeding and pampering with sweets, sweet cakes, bananas, etc., with which "delicate" children are so frequently beguiled. As mentioned above, a satisfactory daily evacuation should be obtained by the use of a regular laxative if necessary; some preparation of paraffin or fresh infusion of senna pods usually suit admirably.

I have often thought that the regular administration of large doses of alkalis has helped to diminish or stay the attacks. When the attack has actually commenced there is no drug which will allay the vomiting, which is eliminative in character. Frequent drinks of warm water, which the child will take with avidity, will assist to

wash out the stomach and render the process less painful. Should any be retained it will be all to the good, replacing some of the fluid lost and diluting the circulating poisons. A brisk purge should be given at the beginning. Feeding by the mouth is generally impossible until the vomiting ceases spontaneously. For the acid-intoxication alkalies may be given, but unfortunately are not likely to be retained by the stomach. In severe cases they should be given intravenously ( $\frac{3}{4}$  i. of sod. bicarb. to  $\frac{5}{6}$  i. of normal saline). The intravenous infusion will also act by diluting the poisons other than those of acid-intoxication. Glucose solution hypodermically will provide a food and treat the acid-intoxication part of the symptoms.

(b). *Delayed Anesthetic Poisoning.*—Here prophylaxis is of the utmost importance. There should be no protracted period of starvation before operation in the case of children. Before all operations of no urgency, children should be under observation for a few days, to allow them to compensate for altered dieting. During this period if glucose be given by the mouth it provides an additional safeguard. If acetone be detected in the urine by ordinary methods of examination, the operation should be postponed until this is stopped by the use of glucose and alkalies. Such a routine is most essential when a history of "biliary attacks" is obtainable, and for children with this history at any rate, chloroform should not be used. If these measures were regularly carried out, delayed anesthetic poisoning—a condition which is not very infrequent, always serious, and often fatal—would become extremely rare. When the attack has de-

veloped the treatment is similar to that for a bout of "cyclical vomiting."

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## ACIDOSIS AND CYCLIC VOMITING IN CHILDHOOD.

BY

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Acidosis is the same disease in children as it is in adults, but the consequences are more serious because undeveloped tissues are more vulnerable than mature ones, and the incidence of the acid intoxication falls especially heavily on the unstable nervous systems of youthful individuals. Although I have little doubt that the general pathology of the whole subject will be adequately dealt with by other contributors to this symposium, I venture to refer somewhat fully to this aspect of the question because

my own views with respect to the causes of the condition are not altogether in harmony with those generally held.

It is perhaps unnecessary for me to point out that the term "acidosis" has now a much wider significance than it had formerly when first introduced by Naunyn to cover a condition in which certain acetone bodies were excreted in the urine of diabetic patients. At the present time the term is employed to explain a number of different conditions in which owing to metabolic disturbances a great variety of different acids, not only acetone bodies, are produced in excess in the body and in the process of neutralization deplete the system of "basic elements." Neither the production of these acids nor their presence in the urine necessarily appears to exercise any serious influence on health, the injuries inflicted depend rather on the removal of bases such as ammonia, calcium, potassium, sodium, magnesia, etc., from the blood and tissue cells. Acids are always produced by the normal processes of metabolism, and fixed bases are always removed from the body for their neutralization, but a condition of true acidosis is not produced, unless the amount of acids produced is great or the alkali depletion excessive. Without attempting to define the distinctions between normal and excessive production I will proceed at once to consider the reasons why an excessive production should, in certain cases, take place. If we could definitely answer this question, most of the difficulties of the problem would disappear. The solutions to the problem which I offer are only tentatively suggested and they have little beyond common sense to support them.

Viewing the question in the very widest manner and remembering the conservative character of the processes of the animal

body, it may be regarded as improbable that such loss of energy as is involved in the passage from the body of semi-oxidized products would be tolerated unless the supply of energy exceeded the physiological needs. I regard over-feeding, that is to say relative over-feeding, as the key not only to the problem of acidosis, but also of many of the common conditions of malnutrition which affect children.

If more food is consumed by the child than is required for the immediate purposes of heat production, the display of energy, and for the maintenance and growth of the tissues, the excess will be dealt with in a manner which will cause the least possible inconvenience to the body as a whole, and will be got rid of by calling into play one of the many protective mechanisms with which the animal system is provided; it is difficult to say, which particular mechanism will be utilized, the choice is merely a question of physiological expediency. In a great majority of cases the most economical method, in a physiological sense, of disposing of excess of nutriment is by storage, in the form of reserves of glycogen or fat, but the limits of storage are at all times inconsiderable, and in many cases extremely small. There are several alternative methods. The excess of food may be burnt up to the normal end-products, carbonic acid, water and urea, without waste of potential energy, but such combustion entails the supply of much oxygen and the production of much heat, it may be physiologically expensive to supply the required amount of oxygen, and impossible to dispose of the resultant heat without great strain being thrown on the temperature regulating mechanism of the body. Under such conditions it may be a better alternative to short circuit the combustion and

allow only a partial metabolism of the food products, the oxidation stopping short at such half-way stages as lactic acid, oxalic acid, uric acid, glycuronic acid, di-acetic acid, or beta-oxybutyric acid, rather than to allow complete oxidation to the usual end-products. Under such condition the excess will be disposed of in a manner which will economize in certain directions, i. e. in the use of oxygen, and in the work of dissipating heat, but a loss will be incurred in others, namely in the abstraction of the bases which are required for the neutralization of the large molecular acid radicles produced. In any particular case it will be for the administrative authorities in the central nervous system to estimate which is the most expedient method to adopt, and having made the selection to call the necessary mechanism into play. There can be little doubt that in the infinite wisdom of nature's operations the best and most economical course will in each case be adopted. The risks of excessive heat production are considerable in the case of infants who are kept warmly swaddled up in a superfluity of clothing, and who are deprived of many of the opportunities for dissipating heat which are open to older children. It is not therefore surprising that nature in the case of slum infants so often adopts, in preference to complete oxidation, an alternative method. The method of wasteful combustion is often selected in the case of such infants and hence a large quantity of acid bodies are produced, and the system is deprived of many basic elements which are employed to neutralize them. If there is an adequate supply of bases to compensate for this loss all is well, if not the tissues will suffer in proportion to the quantity excreted, the red blood corpuscles will suffer loss of potassium or sodium, the

plasma will be depleted of carbonates, the hemoglobin of iron, the bone of calcium, the proteins of ammonia, and so on.

The injuries thus inflicted on the body will be varied and serious, and they will be observable to the experienced eye, even without employing the resources of the pathological laboratory by which exact estimations of the alkali depletion can now be made.

One of the most obvious and striking results of the carbonate depletion from the blood plasma is "acyanotic hyperpnea" in other words rapidity of breathing without blueing of the skin. The loss of carbonic acid carriers makes rapid breathing necessary to compensate for the small quantity of carbonic acid gas which can be got rid of at the lung's surface during a single respiratory act, and the same necessity explains the quick pulse and rapid heart's action.

The clinical picture of the infant suffering from carbonate depletion is like that of pneumonia, namely a flushed face, rapid breathing and a quick pulse. Within the last month I have seen three cases in which typical acidosis was mistaken for pneumonia in young infants.

The injuries inflicted on the red blood corpuscles by the mineral depletion, and it must be remembered that the blood is the first to feel the incidence of the injury, brings about a considerable hemolysis or destruction of red cells. This to some extent interferes with the oxygen supply, but its most striking influence is on the hemogenetic functions of the body; in acidosis very serious anemia would invariably result were it not for the compensatory activities of the blood forming centers in the red marrow of the long bones. This compensatory activity is, I

firmlly believe, the true explanation of the enlargement of the epiphysis in cases of rickets for which I have never heard any other reasonable explanation.

The depletion of calcium and other metallic bases naturally explains the incomplete mineralization of the bones and their softness.

The nervous symptoms are also due to the same causes depleting the nerve cells of their mineral elements. The typical symptoms of rickets can thus be explained on the grounds of an existing acidosis. The usually fat appearance of the subject of rickets is due to storage of excess and the calling into play of the most economical of the protective mechanisms, the sweating represents an attempt at dissipating heat by a method of surface evaporation. The enlarged epiphyses are consequent on the compensatory activity of the red marrow of the long bones. The softness of the bones is due to their demineralization for the supply of neutralizing bases. The deformity or rather want of form of the bones is due to failure of those muscular activities which bring about the normal post-natal changes in the osseous tissues. We may say, then that in the infant the common clinical picture of an acidosis is that of rickets with occasional severe crises which take the form of convulsions or often severe nerve strains, such as attacks of acyanotic hyperpnea.

In older children we get the attacks taking the form of cyclic vomiting, recurrent biliary attacks, sick headaches, or migraine. The attacks are recurrent and definitely periodic, usually because the habits of life and the degree of over-feeding remains uniform, and it requires about the same number of days to produce the necessary degree of acidosis as to produce the storm.

A cure is naturally led to by the loss of appetite, the vomiting and perhaps the diarrhea which supervene in the course of the attack, and then the cycle commences over again.

A very common concomitant or complication of acidosis in childhood is a "coli" infection of the urinary system. The coli bacillus shows strong preference for an acid medium, and hence will not desert the congenial conditions of the large intestine, for the blood or for the urinary tract unless there is an existing or a potential acidosis.

It is one of the most striking features of coli infections of the bladder and kidneys that the degree of acidity of the urine is so high that enormous quantities of alkali must be administered to render it neutral or alkaline. In other words the degree of alkali tolerance is greatly raised. The cure of a coli infection consists in rendering the urine alkaline. Coli infections can be prevented by the same means or by guarding against those causes, namely those associated with over-feeding, which leads to a relatively acid condition of the blood. I do not like to pursue this argument too far, but I suspect that permanent conditions of alkali depletion of the blood may play a part in favoring other infections in childhood. For instance, it may be that the so-called rheumatic diathesis is nothing more than a condition of reduced carbonate content of the blood which invites invasion by certain specific organisms. I feel sure that among the troubles of teething in infants, both as cause and as effect, acidosis plays an important part. Every old wife knows the ammoniacal character of the urine during teething, and the easily decomposable condition of its ammonia-containing contents which this condition of the urine represents, points to acidosis in two ways. It

means a high ammonia output, and also a high hydrogen ion in concentration, both indices of a high degree of acidosis. The nerve storms so liable to occur during teething are partly due to the raised excitability of the whole nervous sphere brought about by the alkali extraction and partly by the direct reflex or irradiated transmission of impulses from the sore gums. I stated in an earlier part of this article that I regarded excess of food as the chief factor in acidosis production and this view is in no way disturbed by the well known fact that starvation invariably leads to the appearance of acetone bodies in the urine. But this statement requires qualification. By "excess" is meant "*relative excess*" and not excess as measured by the usual standards. Since food is required for the purposes of heat and energy production and for the repair and growth of tissue, the amount of food required to fulfill the physiological requirements will differ in each particular case; and consequently the conditions necessary for acidosis production will be most variable also. Each child creates a different physiological demand for food in accordance with his general habits of life; the amount of exercise he takes; the temperature conditions of his environment; his clothing; the climatic conditions and a thousand other varying factors in his surroundings. It follows that a diet which is perfectly physiological under certain conditions may become pathologically excessive under others, and *vice-versa*. I would here state that however important temperature conditions may be in influencing food requirements they play a very insignificant part in comparison to the amount of exercise taken. An active energetic child creates a great demand for food; the sluggish apathetic child has but small require-

ments. What light this throws on the production of rickets and how well it explains the vicious circle set up! With an excessive dietary an acidosis is set up, the acidosis may cause paresis of all muscular activities thus rendering the already excessive dietary a thousand times more excessive and thereby adding to the acidosis.

But even energy requirements do not exhaust the factors which determine what is and what is not a properly adjusted dietary or what will and what will not lead to acidosis production. There may indeed be great demands for sources of energy owing to the environmental conditions, and yet owing to internal disabilities of metabolism, of digestion, of assimilation, of circulation or what not, if the requirements of the external environment are satisfied by the appropriate quantities of food, an acidosis may easily supervene from incomplete oxidation or incomplete utilization of the sources of supply. To give two instances: a child with diabetes may display great energy, live in a cold climate, and fulfill all the other conditions which would entitle him to a large supply of food; but owing to the metabolic disabilities associated with his disease, his diet will consequently become "*relatively excessive*" and he will be unable to oxidize certain of the food elements, notably the fats, to their normal end-products and an intense acidosis may result. As a second illustration I may instance the case of a child with some disability of kidney function; under such conditions he may be deprived of the power of eliminating urine with a high hydrogen ion concentration and under such conditions acid bodies may tend to accumulate in the blood.

In conclusion I would refer to certain points in the treatment of acidosis, dealing

both with the prophylactic and the remedial aspects. In the prevention of acidosis in children the treatment may be summed up in one word, namely "diet," and the essential factor is the avoidance of excess either in respect of the total amount or in respect of any of its component elements. The difficulty of controlling the amount is much more difficult after the bottle stage, when the quantity can be accurately measured. On the other hand after the first year of life the child acquires some power of independent locomotion, and hence creates physiological demands for food which mitigate the dangers of excessive feeding. Knowing how difficult, or impossible, it is for the physician to control the dietary of the pampered child and keep it within the bounds of physiological safety I strongly advise all those whose duty it may be to regulate the dietary of such patients to concentrate their energies on two points: firstly in keeping the diet simple rather than appetizing; secondly in creating demands for food rather than in attempting to curtail the supply. A physiological demand is made by providing opportunities for exercise in the open air; by instituting breathing exercises; by enjoining the wearing of light clothes; by keeping the nursery cool; by insisting on the open window; and if necessary by ordering massage and Swedish exercises. A certain amount of good can be done by limiting the meals to three per day; by forbidding all extras between meals such as cod liver oil, or malt so dearly beloved by anxious parents. The sort of diet I recommend for a child two years of age is: for breakfast, eight ounces of milk, two thick pieces of toast or crusty bread with butter, jam (without seeds, pips or skins) or stewed fruit. For dinner, meat, fish, egg, fowl (in series) plenty of well

boiled vegetables, small quantity of potato, and always a milk pudding and stewed fruit. For tea the same as breakfast. Children thus fed sit down hungry for their meals, but they do not over-eat and there is little temptation to do so, but they remain well and grow strong, which are the chief desiderata. Any child who does not sit down to meals hungry is potentially over-fed, badly managed and probably either in a condition of acidosis or of threatening acidosis.

I have said little throughout this paper of the importance of "balance" in the dietary, feeling convinced that many other contributors will point out how excess of one of the chief food elements will render another group, otherwise adequate in amount, relatively deficient. Or what is the same thing differently expressed, the deficiency of any one food element will render another food group relatively excessive though otherwise adjusted to the physiological requirements. The adequate balance between fats, carbohydrates and proteins constitutes one of the chief prophylactic resources at our command against the production of metabolic derangements.

The routine exhibition of alkalies to children properly fed is quite unnecessary, but the supply of plenty of water for drinking purposes is most essential.

The remedial treatment of an existing acidosis can also be summed up in one word, namely "*alkalies*." These should be given first, last, and all the time; either intravenously, interstitially or orally according to the urgency of the symptoms. Some children show an enormous tolerance for alkalies. If the case is not a severe one I order mixed salts, i. e., bicarbonate of sodium, citrate of potassium and car-

bonate of magnesium in varying proportions, to be given to the extent of one level teaspoonful every morning first thing, in water with orange juice and a small quantity of sugar this makes quite a pleasant effervescent draught. In severe cases of cyclic vomiting the interstitial injection of a pint or more of two per cent. sodium bicarbonate solution often works wonders, especially if combined with citrate of caffeine and infusion of digitalis. By these means the elimination of the neutralized acidotic bodies is greatly expedited.

The following is a short summary of the main conclusions arrived at in the foregoing pages :

#### CONCLUSIONS.

- (1) Acidosis in children presents few features to distinguish it from acidosis in adults.
- (2) Acidosis results from the incomplete oxidation of food material, one of the natural and economic results of over-feeding.
- (3) The main injuries inflicted by an acidosis depend on the abstraction of basic elements.
- (4) The measure of the severity of an acidosis is not to be estimated on the basis of the amount of acetone or other acid bodies in the urine, but on the degree of carbonate depletion. This can be estimated accurately by laboratory method, but accurately enough for clinical purposes by the symptoms produced.
- (5) One of the effects on the system is to cause a serious hemolysis. Hence there must be an active regeneration of red blood corpuscles or a severe anemia would result. This is probably the explanation of the enlarged ends of long bones in rickets.
- (6) The most characteristic symptom is "acyanotic hyperpnea." The more chronic effects are observed in rickets, cyclic vomiting, recurrent bilious attacks and the troubles connected with dentition. It probably plays a

predisposing part in coli and other infections.

(7) The treatment both preventive and remedial consists in the adjustment of the food to the physiological requirements and the avoidance of excess; the curative depends on the administration of alkalies.

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## PREGNANCY TOXEMIA—A STUDY OF ACIDOSIS IN PREGNANCY.

BY

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For many years it has been known that during pregnancy women are liable to develop symptoms resembling those produced by known chemical and bacterial poisons, and, in fatal cases, post-mortem examinations have revealed areas of necrosis scattered widely throughout the body and often most marked in the liver and kidneys. The clinical phenomena and the histological lesions alike, suggest the presence of a poison in the blood-stream and many attempts have been made to discover the nature and source of the poison. The poison has never been isolated, its chemical composition and the nature of the action it exerts upon the tissues are still unknown, even the site of its origin is not definitely proved but its effects have been carefully studied by both the physician and the morbid anatomist.

Pregnancy is a physiological condition, but the boundary between the physiological

and the pathological is ill-defined; vomiting for instance is so common in the early months as to be regarded as a normal phenomenon but it may become so severe as to undermine the health and eventually to kill the patient. Are we justified in concluding that all vomiting of pregnancy is due to toxemia? Underlying this and similar questions is the deeper problem of the relation between the developing ovum and the mother. Is the relationship that of a symbiosis mutually advantageous or is the ovum an invader against which the mother has to set up elaborate body defenses?

The manifestations of pregnancy toxemia are manifold: vomiting, salivation, pruritus, rashes, neuritis, obstetrical paralyses and similar conditions are grouped together under the term of "minor manifestations" whilst those which directly threaten the life of the patient, eclampsia, icterus gravis gravidarum, pernicious anemia and toxic vomiting are termed "the graver manifestations" of pregnancy toxemia.

It is impossible to enter into the controversies which have raged and which still rage concerning the source of the toxin, four theories only need be mentioned:

1. The bacterial theory, according to which the toxin is formed as a result of a bacterial infection; the presence of such an infection has however never been demonstrated.

2. The theory of a maternal gastro-intestinal auto-intoxication; the holders of this theory believe that the lesions depend upon poisonous bodies formed in the process of digestion which enter the blood-stream through the portal circulation.

3. The fetal theory regards the toxins as products of fetal metabolism which enter the maternal blood-stream by way of the placental circulation.

4. The placental theory; this theory regards the trophoblast of the chronic villi as the source of the toxins: we know that enzymes capable of exerting a destructive action upon the maternal tissues are produced by the trophoblast and that these enzymes play an important role in the embedding of the ovum in the uterine mucosa: we know further that when the growth of the trophoblast is abnormally great, as in the case of hydatidiform moles, symptoms of toxemia are usually present and are often very pronounced although the fetus, if it ever existed, perished at a very early stage of the pregnancy. The passage of portions of trophoblast into the maternal blood-stream is a phenomenon capable of demonstration in normal pregnancies and by Abderhalden's test we can show that the blood of a pregnant woman invariably contains ferments specific to placental proteins. These and other considerations lead us to accept the view that the pregnancy toxins have their ultimate source in the placenta. It is probable that the enzymes themselves are not toxic, but by their action on maternal cells toxic substances are produced, and further there is evidence to show that the ferments not only themselves initiate degenerative changes but also excite to increased activity intra-cellular ferments already present.

The study of acidosis in pregnancy toxemia is beset with difficulties. Acidosis may be caused by any alteration of tissue-metabolism which results in the formation of an excessive quantity of acid radicles. Such acid radicles combine with alkalies to form salts and in this form are excreted in the urine. The bases which combine with and neutralize the acid radicles are:

1. Ammonia a product of protein metabolism which is normally carried to the

liver, there converted into urea and as such excreted in the urine.

2. Sodium and potassium compounds from the fluids and cells of the body. When the amount of acid radicles is so great that they cannot be neutralized by these alkalies the symptoms of acid intoxication, rapid pulse, deep breathing and coma supervene. A condition of acidosis may however exist for a long time before the symptoms of acid intoxication become manifest.

I have endeavored both by clinical observation and by experiment to ascertain to what extent the phenomena of acidosis are present in the toxemia of pregnancy. It is sometimes asserted that pregnancy toxemia is nothing more or less than an acidosis. This is incorrect for whilst it is true that in the majority of cases an acidosis is present and that the symptoms of acid intoxication form a striking feature of the clinical picture in fatal cases, we meet occasionally with instances of pregnancy toxemia uncomplicated by acidosis.

In conducting this enquiry it is necessary to bear in mind that acidosis may be produced by a variety of conditions which are apt to complicate pregnancy toxemia, thus it is present in persistent vomiting, in carbohydrate starvation and after the administration of chloroform; we must therefore exclude from our results all cases in which these complications are present. This reservation materially restricts the field of our observations and limits the value to be attached to the presence of an acidosis in the diagnosis of pregnancy toxemia.

In my own observations I have employed four tests to determine the presence of an acidosis.

1. The estimation of the alkalinity or

rather the acid combining property of the blood serum.

2. The estimation of the proportion of nitrogen excreted in the urine in the form of ammonia salts.

3. The demonstration of the presence of acetone and diacetic acid in the urine.

4. The determination of the amount of sodium bicarbonate (administered by the mouth) necessary to render the urine alkaline.

1. *The Alkalinity of the Blood.* This has been determined by a modification of the method described by Sir Almoth Wright, the blood was withdrawn from a superficial vein, allowed to coagulate in a glass capsule and the serum drawn off. The alkalinity of the serum thus drawn off was estimated as follows. A number of solutions of normal sulphuric acid diluted with distilled water were prepared in strengths varying from 1 in 20 to 1 in a 100. 0.25 c. c. of the serum was mixed with 0.25 of the acid solutions and the strength of the acid solution required to neutralize the equal volume of serum was ascertained, a standardized solution of litmus being used as the indicator. Wright's observations have shown that in a normal individual who is not pregnant the strength of the acid solution required to neutralize the serum is between 1 in 30 and 1 in 45, average being 1 in 35. This may be expressed by the formula:  $\frac{N}{35} \text{ H}_2\text{SO}_4$ .

It was first necessary to determine whether there was any alteration in the alkalinity of the blood in normal pregnancy. For this purpose I examined the blood of six women between the 30th and the 40th week of their pregnancy. Three observations were taken in each case and the formula given in the result of the three

observations. The results were as follows:—

Case 1.	32 weeks	.....N H <sub>2</sub> SO <sub>4</sub>	<u>38</u>
Case 2.	34 weeks	.....N "	<u>40</u>
Case 3.	35 weeks	.....N "	<u>39</u>
Case 4.	38 weeks	.....N "	<u>37</u>
Case 5.	38 weeks	.....N "	<u>42</u>
Case 6.	40 weeks	.....N "	<u>40</u>

Comparing these figures with those obtained by Wright, it appears that normally there is a slight diminution in the alkalinity of the blood during pregnancy. The diminution is small, but it is important for it suggests that symptoms of acid intoxication may be produced in pregnant women by smaller doses of acid radicles than in the case of the non-gravid.

In marked contrast to these are the results obtained in nine well marked cases of pregnancy toxemia:—

Case 1.	Eclampsia (after two fits)	.....N H <sub>2</sub> SO <sub>4</sub>	<u>68</u>
Case 2.	Kidney of pregnancy	.....N "	<u>54</u>
Case 3.	Eclampsia (before fits)	.....N "	<u>70</u>
Case 4.	Eclampsia (before fits)	.....N "	<u>48</u>
Case 5.	Eclampsia (after seven fits)	.....N "	<u>72</u>
Case 6.	Kidney of pregnancy	.....N "	<u>84</u>
Case 7.	Kidney of pregnancy	.....N "	<u>62</u>
Case 8.	Eclampsia (after one fit)	.....N "	<u>72</u>
Case 9.	Eclampsia (before fits)	.....N "	<u>88</u>

In these cases it is seen that the diminution in the alkalinity of the blood is marked, but the fall in the alkalinity bore no definite relation to the severity of the toxemia. Thus in case 9 in which the fall was greatest the patient had only two eclamptic fits, she rapidly regained consciousness, the temperature reached only 100.5° F. and her recovery was rapid. The opposite condition is seen in case 5 when the fall in alkalinity is much less marked but the patient died in profound coma after many violent convulsions.

It is interesting to contrast these results with a series of similar observations made in four cases of pregnancy complicated by chronic nephritis.

Case 1.	Gravida, 36 weeks	.....N H SO	<u>40</u>
Case 2.	Gravida, 35 weeks	.....N "	<u>42</u>
Case 3.	Gravida, 30 weeks	.....N "	<u>38</u>
Case 4.	Gravida, 38 weeks	.....N "	<u>40</u>

In these cases the fall in alkalinity is no greater than that found in normal pregnancy.

It must be borne in mind however, that the conditions of chronic nephritis and pregnancy toxemia may coexist in the same patient. A damaged kidney is more susceptible than a healthy one to the actions of pregnancy toxins, and the lesions of an acute toxemia are often grafted on to those of chronic nephritis. To this combination of lesions the term "nephritic toxemia" is applied. The condition found post mortem is characteristic; the kidneys present two sets of lesions: (a) They are contracted granular and contain an excess of fibrous tissue, evidences of long standing disease. (b) There is an acute epithelial degenera-

tion as though a virulent poison had descended upon the kidneys and killed the epithelial cells in their attempts to excrete it. The symptoms of nephritic toxemia may develop at any stage of pregnancy; I have seen them prove fatal as early as the tenth week, but more usually they develop during the last twelve weeks.

I shall endeavor to show that if we find a marked diminution in the alkalinity of the blood in a case of chronic nephritis we are justified in concluding that a pregnancy toxemia has supervened.

*Criticism of the Value of the Results Obtained by the Method Employed for Estimating the Alkalinity of the Blood.* In employing this method we cannot claim to estimate accurately the alkalinity of the blood, but having established a normal standard we can detect deviations from that standard, and this is all that is required for the purpose we have in view. Whether we are justified in regarding the diminished alkalinity of the blood as evidence of acidosis in these cases is another question altogether, for in eclampsia lactic acid can often be found in the blood, and it is quite possible that the fall of alkalinity is due in part at least to this cause. Lactic acid may be found after any violent muscular exertion, particularly if the supply of oxygen is deficient and has been detected in considerable quantities after the convulsions of uremia. It must be borne in mind that in acidosis induced by the administration of mineral acids it is some time before the alkalinity of the blood is diminished, for the alkalis are extracted first from the tissues and from the blood only when this supply begins to fail, hence a diminished alkalinity is not to be looked for as an early sign of acidosis, and I have not found it in the slighter cases of toxemia.

I feel justified, however, in concluding that in cases of albuminuria of doubtful origin in pregnancy the determination of the alkalinity of the blood should form part of the investigation and sometimes affords considerable help in reaching a diagnosis.

*2. The Proportion of Nitrogen Excreted in the Form of Ammonia Salts.* The total nitrogen was estimated by Kjeldahl's method, by which all nitrogen is converted into ammonia and estimated as ammonia sulphate; the urea was estimated by the sodium hypobromite method, and the ammonia by Schlosing's method. The results have shown uniformly an increase in the ammonia coefficient, while in chronic nephritis cases such a rise has not been noted, except in one case where convulsions supervened, and in this case it is doubtful whether the convulsions should be regarded as uremic or eclamptic. Observations in normal pregnancy have shown that from 80 to 85 per cent. of the nitrogen is excreted as urea and 4 to 5 per cent. as ammonia.

I will first give the figures we obtained in the cases of toxemia:—

		Urea per cent.	Ammonia per cent.
Case 1.	Eclampsia .....	63	16
Case 2.	Kidney of pregnancy.....	71	12
Case 3.	Kidney of pregnancy .....	63	18
Case 4.	Eclampsia .....	62	18
Case 5.	Eclampsia .....	51	16
Case 6.	Eclampsia .....	68	22
Case 7.	Icterus gravis .....	63	17
Case 8.	Kidney of pregnancy .....	74	10
Case *9.	Kidney of pregnancy .....	63	21
Case 10.	Kidney of pregnancy .....	66	14

\*Convulsions 10 days later.

It will be seen that in this series of cases the ammonia coefficient is high throughout and the urea coefficient is diminished. It is also to be noticed that the proportion of undetermined nitrogen is usually high.

Let us now compare a series of six cases of chronic nephritis:—

	Urea per cent.	Ammonia per cent.
Case 1. Gravida, 32 weeks .....	82	5
Case 2. Gravida, 35 weeks .....	80	6
Case *3. Gravida, 28 weeks .....	62	14
Case 4. Gravida, 30 weeks .....	87	4
Case 5. Gravida, 20 weeks .....	83	5
Case 6. Gravida, 38 weeks .....	78	7

\*Convulsions? uremic? eclamptic.

With the exception of case 3 there is very little alteration of the urea-ammonia ratio, and further the urea + ammonia is practically a constant quantity. There is no marked increase in the quantity of undetermined nitrogen. The six patients in this list are known definitely to have suffered from chronic nephritis before the commencement of the pregnancy—in most cases the symptoms became more marked as pregnancy advanced, but there were no sudden or acute exacerbations such as occur in nephritic toxemia.

These results point to the conclusion that an increase in the ammonia coefficient is constant when the symptoms of toxemia are marked and is but seldom present in chronic nephritis. It is well known that an increase in the ammonia coefficient may be caused by an excessive ingestion of proteins, by starvation, or by any disease which leads to a disintegration of liver tissue. In the majority of cases there had been no starvation and there had been no excessive ingestion of protein, indeed, before the observations were made some of the patients had been carefully dieted for several days.

I believe that the high ammonia coefficient is to be attributed to the action of the pregnancy toxins upon the liver, but my observations do not justify me in conclud-

ing that the ammonia coefficient can be regarded as an index of the gravity of the hepatic lesions. It has been stated that the damaged liver is unable to convert the ammonia brought to it into urea, but this explanation is probably not correct, for after the administration of sodium bicarbonate the ammonia falls and the urea increases.

3. *The Presence of Acetone Bodies—Beta-Oxybutyric Acid, Diacetic Acid, Acetone.* In every case of severe toxemia acetone and diacetic acid have been detected—in several of the milder cases both were absent. For the detection of acetone a modification of Rothera's test was employed: 5 c. c. of urine are shaken up in a test tube with ammonium sulphate until saturated, 0.5 c. c. of strong ammonia is added, and then three or four drops of freshly prepared solution of sodium nitroprusside; if acetone be present a delicate purple color is produced. The presence of diacetic acid was demonstrated by the well known ferric chloride test. In 50 cases of normal pregnancy neither acetone nor diacetic acid were found. The cases of nephritis in pregnant women gave interesting results: 15 cases were examined; in 10 both bodies were absent, in 5 both were present. The urine from 20 cases of chronic nephritis was examined; two of the patients had previously had uremic convulsions; in none of the 20 cases were either acetone or diacetic acid discovered. The results may be tabulated thus:—

	Acetone	Diacetic acid
Total cases of albuminuria examined .....	67	
Pregnancy toxemia (with marked symptoms) ....	32	32
Chronic nephritic pregnancy .....	15	5
Chronic nephritis in the non-gravid .....	20	0
Normal pregnancy.....	50	0

The five cases of nephritis in which

these bodies were detected showed symptoms indicating the development of a pregnancy toxemia—a sudden increase in the edema, the onset of headache, and an increase in the amount of albumin. I think I am justified in believing that a pregnancy toxemia had supervened upon a preexisting nephritis.

I regard the presence of acetone and diacetic acid as probably due to the effects produced upon the liver cells by the pregnancy toxins. It is generally agreed that beta-oxybutyric acid, the mother substance of both acetone and diacetic acid, is derived from fats. The fat used by the body is probably carried to the liver and there elaborated and broken up into smaller molecules in the process of oxidation. The liver damaged by the pregnancy toxins, is unable to deal adequately with the fat brought to it, and disordered fat metabolism results. It is well known that by the administration of carbohydrates the acetone bodies are diminished; that is attributed to the fact that the carbohydrate spares the fat and so relieves the strain upon the liver. It has been suggested also that the carbohydrates supply an easily assimilable nutrient to the liver cells and enable them to regain to some extent their normal functions.

*4. The Amount of Sodium Bicarbonate Administered by the Mouth Required to make the Urine Alkaline.* In a normal person two drams of sodium bicarbonate administered by the mouth will usually render the urine alkaline in 24 hours. In chronic nephritis this effect is produced by the same dose, but in pregnancy toxemia a larger dose is required. This fact is illustrated by the following series of cases:—

Case 1. Eclampsia, 3<sup>iii</sup> .....urine-acid  
Case 2. Eclampsia, 3<sup>ii</sup> ..... " "

- |         |  |               |
|---------|--|---------------|
| Case 3. | Kidney of pregnancy,<br>3 <sup>iii</sup> ..... | urine-neutral |
| Case 4. | Kidney of pregnancy,<br>3 <sup>ii</sup> .....  | urine-acid    |
| Case 5. | Eclampsia, 3 <sup>iii</sup> .....              | " "           |
| Case 6. | Kidney of pregnancy,<br>3 <sup>ii</sup> .....  | " "           |

I place but little value on this test by itself but it confirms the results obtained by other methods.

#### CONCLUSIONS.

From the evidence before us we are justified in concluding that a condition of acidosis is usually associated with pregnancy toxemia. In the earlier and slighter cases the tests applied failed to demonstrate the presence of an acidosis and in a severe case of eclampsia recently under my care a similar negative result was obtained. This case has convinced me that further investigations are required and that certain conditions, with which as yet we are very imperfectly acquainted, must be ascertained before we can definitely establish the relationship existing between pregnancy toxemia and acidosis.

I do not believe that the symptoms of toxemia are due to acidosis; indeed these results definitely disprove this theory, because the symptoms are often present in a mild form before we can find any evidence of acidosis, but the results of treatment have convinced me that if we diminish the acidosis we alleviate the severity of the symptoms. In severe cases of eclampsia I have seen marked improvement follow intravenous infusion of solutions of sodium acetate and sodium bicarbonate.

#### REMARKS ON TREATMENT.

In the light of these observations I would draw attention to some important points in treatment.

1. In cases of pregnancy toxemia chloroform should never be administered, because the action of chloroform is to render more grave the lesions which already exist and increase the acidosis. Ether administered by the open method is in every way preferable as an anesthetic.

2. Calomel should not be used as an aperient, for the lesions in the liver and kidney produced by mercurial poisoning are of the same nature as those of pregnancy toxemia, and it is probable that mercury even in small doses will increase the gravity of the lesions already existing.

3. For a similar reason douches of mercurial antiseptics should never be employed.

4. In all cases where an acidosis is present intravenous infusion with a solution of sodium bicarbonate or sodium acetate should be practised.

5. The fat metabolism should be spared as far as possible by the administration of glucose. My practice has been to administer it by the rectum when vomiting is present and to give it by the mouth in the form of glucose lemonade where the digestive functions are not deranged.

6. When a pregnant woman suffering from chronic nephritis shows evidence of the existence of acidosis, the uterine contents should be evacuated without delay, for with a kidney previously damaged the prognosis of pregnancy toxemia is very grave.

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**Treatment of Sciatica.**—Bacterin treatment is being used with good success in the treatment of sciatica (*Clinical Med.*, May, 1916). Search for some point of focal infection. Occasionally it will be found in an infected bladder or an inflamed prostate. Zapffe cured a case with a bacterin made from staphylococci and a diphtheroid bacillus found in the urine.

## ACETONEMIA.

BY

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In 1907, the fact that there was a relation between persistent vomiting and acetone in the urine and its relief with material doses of bicarbonate of soda was first noticed by me, and I watched assiduously all the cases of vomiting which were admitted to the hospital. After we had observed a number of these cases, we published an article in 1908.<sup>1</sup> During the following year, many of the physicians of Boston were asked to refer all cases of sudden and severe vomiting to us, and the authorities at the Massachusetts Homeopathic Hospital allowed us to receive and treat as many cases of vomiting as applied. The first experiment we tried was the giving of bicarbonate of soda to all patients having severe vomiting. Almost immediately we discovered that the cases which did not show acetone in the urine did not receive any benefit from this treatment, while those that did show acetone in the urine received almost immediate benefit. From that time, the patients observed were limited to those cases of vomiting which showed considerable amounts of acetone in the urine, and the next step in our experiments was to determine the size of the dose of bicarbonate of soda to be given.

In the course of several months, during which we gave various sized doses to several series of ten consecutive cases, we found that the proper dose varied from 15 to 150 grains in 24 hours, but that the best rule to follow was to give enough bicarbonate of soda to cause the acetone to dis-

<sup>1</sup> "Something New in Auto-Intoxication," by S. H. Blodgett, M. D., and A. A. Starbuck, M. D., *N. A. Journal of Homeopathy*.

pear promptly from the urine. After this is accomplished, the amount of bicarbonate of soda should be decreased; otherwise, an irritation of the stomach might be caused by the persistent use of large doses of the alkali. While carrying on these experiments, we also of necessity had to find out which was the best manner in which to give the alkali. It can be easily realized that to patients vomiting so constantly that it became necessary for them to lie in bed with a basin under the side of the face, it would be hard to give any medicine by the mouth and have it retained. We found that the medicine could be given intravenously in cases of emergency. This method, we found, however, was not as satisfactory as to give it intramuscularly. In our first trials of this method the needle was introduced under the breast—and the dose used was forty grains in a pint of normal saline. Ultimately we found that the most satisfactory place for intramuscular use was under the skin over the scapula. Here it could be used without any danger and forty grains dissolved in twelve ounces of normal saline could be given and repeated (over the other scapula) within an hour. This in every case caused so much improvement that the medicine could be then given and retained by the mouth.

By the mouth, we found that various methods could be used. In some cases, forty to sixty grains bicarbonate of soda are dissolved in a glass of water and the patient is told to take a sip frequently using the total amount in twelve to twenty-four hours. In other cases, ten grains are dissolved in one-half ounce of boiling water, to which is added one-half ounce of weak tea—this dose is repeated in from two to four hours, as may be necessary. The bicarbonate of soda may also be dissolved in

an ounce of thin meat soup; or in hot water, to which is added a little orange juice. In two cases, we have had satisfactory results from dissolving it in hot lemonade, to which has been added a small amount of sugar. The series of cases to which the alkali was given dissolved in milk or coffee were not benefited. A series of cases was treated in which we gave the alkali dissolved in water by the rectum, as a rectal enema. These cases did not improve until the medicine was given by the mouth. I have never tried the seepage method by the rectum, which I understand has produced satisfactory results in the hands of other physicians.

The next line of study which we undertook in these cases was the question of diet. We placed the cases as they came in series of ten on various diets; one series on a carbohydrate free diet, another one on a mixed diet and another on a carbohydrate diet, and so forth. The result of these experiments after watching a great number of these cases, showed that the particular article of diet the patients received, had absolutely nothing to do with the recovery, and that the patients on a carbohydrate diet recovered as quickly as those on a meat diet, and *vice versa*.

The question of the amount of food to be given was next considered and here we found the most striking results. The cessation of the vomiting was much more prompt in the cases where we gave very small amounts of food, irrespective of the kinds of food used, and after three years' work on these cases, we found that the best results were obtained by allowing the patient to have anything which she wished to eat, but limiting the amounts in severe cases to not over one-half ounce of liquid and a piece of solid as large as a twenty-five cent piece, repeated not oftener than

once in two hours. As the vomiting began to disappear, the amount of food was doubled, care being taken however, not to increase the amount of food at each feeding too rapidly. In the cases where there was a great thirst as sometimes happened, the patient was allowed to have two teaspoonfuls of water at five minute intervals until the thirst had disappeared.

While watching these cases, we noticed that while the larger proportion of the cases, especially those seen in our early work, were cases of pregnancy; still, we received a considerable number of cases of vomiting in children, and some few in grown people, and now and again a post-operative case where the vomiting would be called pernicious. The cases occurring in children led me at once to investigate the question whether this particular condition had any connection with the so-called cyclic vomiting of children and the request was sent to physicians to refer to us all cases of so-called, cyclic vomiting which occurred in their practice. Soon, enough cases had been received and recorded to allow us to see that the so-called cyclic vomiting in children was the result of this condition.

We undertook a considerable number of experiments to see what could be accomplished in regard to the prophylaxis of succeeding attacks in so-called cyclic vomiting and we found that in many cases by the administration of 5 to 10 gr. bicarbonate of soda daily for a few weeks, then every alternate week, the child could go for a long time or indefinitely without an attack, unless some germ borne epidemic became prevalent. In such a case, the bicarbonate of soda was given in increased doses immediately on appearance of any symptoms of the prevailing epidemic.

During the first two years of this work, I discovered that oftentimes patients complained of severe pain over the region of the stomach. We then began to examine each case for abdominal soreness, and we found that if slow, rather deep pressure was used over the abdomen with the point of the finger (while there might be more or less general muscular soreness on account of the vomiting) there would be a sore spot developed over the region of the pancreas. This was so constant in these cases that it became almost pathognomonic. Finally, to determine whether this "sore spot" was present and to eliminate the element of personality, in 1915, we examined the urine from one hundred consecutive cases of contagious disease, and had the house physician, Dr. Clement, make the examination for the "sore spot." Each kept our own records. The results in each case were not known to the other, until three months after the series had been finished. The sore spot occurred in over eighty-three percent of the cases.<sup>1</sup>

The relation between the ordinary post ether vomiting and the use of bicarbonate of soda was investigated by Dr. C. T. Howard. He found that by giving every alternate case previous to operation, bicarbonate of soda, there was a very decided decrease in the amount of vomiting in the cases which had been given bicarbonate of soda. This was so noticeable that the nurses in the recovery room used to guess which cases in the clinic had received bicarbonate of soda, and which had not, and were almost invariably correct.

In regard to the epidemics of so-called "acidosis," our theory is that any germ epidemic which may be prevalent or any germ

<sup>1</sup>"Acetonuria in Relation to Contagious Diseases," *Medical Record*, April, 1916.

disease which affects a person, whether during epidemic or not, may cause a disturbance in the pancreas, which in turn causes a disturbance in the retrograde metabolism, and this causes acetone to appear in the blood and later in the urine, in such amounts as to cause poisoning. This would explain the epidemics of so-called "acidosis," followed in some cases, by death. These "acidosis" cases have occurred during epidemics of septic sore throat, also grippe and influenza. That the acetone is not caused by carbohydrate starvation (as has been claimed by many) is amply shown by us in "Acetonuria and Carbohydrate Starvation."<sup>1</sup>

Investigations which are at present being made regarding the alveolar air tension will in the immediate future probably help to explain many points which are at present doubtful.

In closing, I would call attention to the following conclusions:—

(1). That there is a form of very persistent vomiting of which the symptom, to differentiate it from other forms of vomiting, is the appearance of considerable amounts of acetone in the urine, and the "sore spot" over the pancreas.

(2). That this "sore spot" is present in at least 85 per cent of the cases.

(3) That this form of vomiting begins with a clean tongue and without digestive disturbance.

(4) That about 85 per cent of this form of vomiting occurs during pregnancy, about ten per cent. occurs in children (when it is usually called cyclic vomiting), about four per cent. occurs in adults, and about one per cent. in post-operative cases.

(5). That the vomiting in each of these

conditions is from the same cause and is relieved by the same treatment.

(6). That this cause is probably a disturbance in the pancreas, occasionally due (more especially in children) to an infection.

(7). That the treatment consists in giving enough bicarbonate of soda to cause the acetone to disappear from the urine, and the giving of very small amounts of food at frequent intervals, which should not be increased until the vomiting has practically ceased.

## ACIDOSIS: ITS SOURCE AND NATURE.

BY

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Acetonuria is engaging the attention of many clinicians and experimenters, and the literature of the subject has been enriched by a number of interesting and enlightening contributions. When one reads, however, the conflicting opinions expressed as to the source and nature of the condition, and endeavors to summarize what is definitely known, one finds that the facts established are confined within a rather small compass. It is chiefly with these facts that the writer will concern himself.

Acetone ( $C_3 H_6 O = \text{dimethylketone} = CH_3 - CO - CH_3$ ) is a thin, colorless liquid, of neutral reaction and of a peculiar aromatic odor. It was first found, in 1857, by Petters in the urine of a diabetic patient. The urine of healthy individuals contains not more than 10 mg. per day. During starvation and in certain diseases the quantity is markedly increased.

<sup>1</sup> New York Medical Record, August 18, 1915.

The origin of beta-oxybutyric acid, diacetic acid, and acetone has not been ascertained; but there are strong reasons for believing that they are formed in the tissues from the metabolism of fats and carbohydrates. The excretion of acetone takes place mostly through the kidneys and lungs, while a portion of the substance is broken up in the body.

While the injurious effects of acetone under certain conditions have been well established, the tolerance of it by the system is at times remarkable. In these respects it can be compared with the action of urea, indican, and other products which may persist for some time without giving rise to injurious effects. The long-continued presence of acetone in the urine of diabetics, with the absence of untoward symptoms, is well known. Experimentally, large amounts can be safely injected into animals. On the other hand, the amount of acetone found in the urine is not always an index of the toxic influence upon the patient, especially in diseases which interfere with proper elimination, and in lessened alkalinity of the blood retarding diuresis. Hence the importance of blood examinations when the symptoms of acidosis are present and when urinary analysis fails to reveal the source of the toxemia; for the diminished alkalinity of the body produced by acetone reduces the carbon dioxide in the venous blood. In this connection it should not be forgotten that certain cases of diabetic coma in which acetonuria did not exist justify the belief that, even when acetone is found, it may not be the cause of the coma. Polypeptic intoxication, amino-acids, or other substances as yet unknown, are supposed by some investigators to be the cause.

The fact that acetone appears in various conditions of food metabolism or of the digestive organs proves that its presence may be due to a number of allied causes. One set of observers will lay stress upon the result of abnormal fatty acid metabolism from an overworked liver leading to fat infiltration of that organ; or to the effects of an excessive or exclusive diet of hydrocarbons. Another set emphasizes the effect of starvation or deprivation of carbohydrates, while another attaches paramount importance to an excess of proteids. After studying the experiments and statements upon which the foregoing opinions are based, one comes to the reasonable conclusion that organic disease of any of the digestive organs, or overtaxing of their functions by dietetic imprudences may give rise to acetonuria. Even conflicting views may lead to the truth, while the practical clinician, summing up all the evidence and reconciling all the diversities of opinion, cures many of his patients by putting the digestive organs in good order and maintaining a proper food balance. It is safe to assert that the majority of cases of cyclic vomiting in children can be prevented by regulation of the diet. It is the beneficial effects of vomiting and an empty stomach in these cases, with the stirring help of a dose of calomel, which brings relief as much as carbohydrate feeding and alkalis. Even in cases in which the stomach rejects everything and in which rectal alimentation or medication is impracticable, nature comes to the rescue, and recovery is the rule. She is very kind to the little candy-stuffers, whose excesses in this form of carbohydrate do not always stave off acetonuria.

'It is interesting to note the diseases or conditions in which acetonuria has been

found. Among them are the following:—Diabetes, typhus and typhoid fever, scarlet fever, variola, diphtheria, pneumonia, appendicitis, nephritis, pregnancy, chronic morphinism, phloridzin poisoning, lactosuria, strangulated hernia, anesthesia, adenoids, extirpation of the pancreas, some forms of carcinoma, psychoses, auto-intoxication, excessive use of protein food, and various digestive disturbances. The author has observed acidosis in general sepsis, exophthalmic goitre, trichiniasis, insanity, mitral regurgitation, and other morbid states. The list is not intended to be complete; nor is it improbable that excess of acetone may occur in the course of any disease which interferes with metabolism.

Carbohydrate starvation has been regarded by many as one of the main conditions in which acetone appears, but in the *New York Medical Journal*, Aug. 28, 1915, Dr. Stephen H. Blodgett, of Boston, has an article which should command attention for its experimental and practical value on this subject. My own limited observations lead me to agree with Dr. Blodgett's conclusions, which are as follows:

Acetone in the urine may be caused experimentally by carbohydrate starvation, but not clinically, except to a very slight extent.

Acetone alone, or in conjunction with diacetic acid, may, and in this unnamed condition frequently does, appear in the urine, often in enormous amounts, where there has been no carbohydrate starvation.

Therefore, the theory that a carbohydrate should be pushed in this condition appears to be unfounded.

The symptoms of acetone intoxication as given by various writers are: Anorexia, coated tongue, excessive thirst, nausea, vomiting, diarrhea, abdominal pain, tachy-

cardia and other circulatory disturbances, dyspnea, aromatic odor of the breath, pallor, pruritus, hemoglobinuria, increase of temperature, headache, restlessness, vertigo, somnolence, convulsions and coma. Dr. Blodgett emphasizes, as an almost pathognomonic sign, soreness on *deep pressure* at a spot about two inches in diameter over the pancreas. Dr. B. W. Rhamy, of Texas, (*Journal of the American Medical Association*, March 2, 1912), states that a toxic dose of pure acetone produces in guinea-pigs coma, rapid respiration, nervous phenomena, itching, dizziness, muscular twitching, temporary mental disturbance, and sometimes rapid clonic spasms. Post-mortem examinations of guinea-pigs killed by acetone reveal fatty degeneration of the liver and kidneys, with hardened and ruptured blood-vessels and hemorrhagic extravasation.

Acknowledging that any one or a number of these symptoms may be directly attributable to the toxemia, we should bear in mind that the disorder causing the acidosis may give rise to some of these symptoms, and that the primary disease should be deemed more important than the reactive influence of secondary effects. It is essential to correct treatment that signs and symptoms should, as far as possible, be referred to their true source. On the other hand, just as pulmonary edema from cardiac insufficiency may be the most urgent condition demanding relief, so may the treatment of acetone toxemia be at first more important than the treatment of the hidden or apparent condition which produces it.

From what has been stated it is evident that the significance of acetonuria in a given case depends upon the underlying causative conditions and the symptoms. It

may persist over quite a length of time without giving rise to manifestly unpleasant symptoms, while it may come on rapidly and cause death. Occurring in diseases not serious in themselves, during pregnancy, or as a result of anesthesia, and accompanied with symptoms attributable to nothing else, acetonuria should always be regarded with concern, and prompt measures for its relief should be instituted. In certain patients the presence of nausea, vomiting, fever, and marked nervous symptoms point directly to the toxemia, especially when these symptoms cannot be otherwise explained. The real source of the acetone may not be ascertained, but the primary cause may be trivial compared with the injury done by its secondary effects. Since the importance of the subject has been brought prominently into view, the value of routine examinations of the urine has been recognized, and the true nature of certain cases presenting difficulties in diagnosis has been established. The toxicity of any substance must be great which produces, as we have strong reasons for believing, rapid fatty degeneration of the liver and kidneys, jaundice, and hematuria. Such morbid changes have been ascribed to acetone following anesthesia, but it remains to be finally proven whether the liver and kidney changes are due directly to the anesthetic, or to the acetone produced by the disturbed metabolism which accompanies anesthesia. When this question shall have been settled, the influence of acetone upon the economy will be better understood.

The diagnosis of acetone poisoning can usually be made from the symptoms and the examination of the urine. Where the disorder is suspected and the urinary findings are not in sufficient evidence, a blood test may reveal the condition; but it must

be borne in mind that acidosis and toxemia do not always accompany each other. Dr. Yandell Harrison, of Yale, (*J. A. M. A.*, July 25, 1914), calls attention to the practical point that the degree of acidosis can be approximately estimated by the length of time that the breath can be held, and advises against general anesthesia unless the breathing can be suspended for twenty seconds.

The successful treatment of acetonuria depends to a great extent upon the removal of its cause. Occurring in the course of acute disorders, it disappears with the subsidence of the responsible disease. In persistent disorders, however, acidosis may prove rebellious and materially add to the gravity of the patient's condition. One of the measures adopted by nearly all practitioners is the use of alkalis, sodium bicarbonate or citrate being especially beneficial. According to indications sodium bicarbonate is administered by the mouth, bowel, or veins, the doses being governed by the effect produced upon the acidity of the urine and the patient's symptoms. Attention has been called to the fact that, in certain cases of diabetes, the iron test for diacetic acid was more marked when sodium bicarbonate was continued, and that the constant use of this salt was not required. Valuable as this agent is, it sometimes fails to bring about the desired result, while it fails for the most part to relieve the coma of diabetic acidosis, whether introduced by the mouth, rectum, or veins.

Elimination through the intestines and kidneys is an important measure, and careful attention should be paid to the regulation of the digestive system. So far as diet is concerned it is evident from recent observations that exclusive or excessive carbohydrate feeding is not indicated. The

individual should be treated and the appropriate food balance of each case be secured.

It is needless to emphasize the importance of treating the primary and underlying causes of acidosis. The writer has had under his care for several years a young woman with a marked mitral insufficiency, who develops acidosis whenever she overtaxes her heart. The symptoms have at times been alarming, consisting of nausea, vomiting, headache, backache, and hematuria. In this case, rest in bed and morphia hypodermatically are the most efficient means of relief, although the usual methods of treatment, when practicable, are employed.

Judging from the comments of numerous practitioners, we are justified in regarding acetonuria as a condition which may or may not be serious, and the influence of which during the course of any other disease should be kept in view. If it be of a mild type and present no marked symptoms, and if it be chronic in character, it would seem that its presence should not preclude anesthesia, although precautions should be used in the preparation of the patient. Under appropriate measures it will frequently disappear during pregnancy, but its severity may at times necessitate premature delivery. Treatment is usually satisfactory and consists of regulation of the digestive functions, the avoidance of extremes in diet, elimination, and the maintenance of the alkalinity of the blood. Special symptoms are to be managed according to their nature and indications.

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**Iodine Antidote.**—If an excess of iodine has been taken into the stomach, starch will be found to be the best antidote. The starch should be boiled. Until sufficient can be prepared, it is well to give bread which has been soaked in water.—*Exchange.*

## ARE THERE KETONES OF INTESTINAL PRODUCTION?

BY

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This brief article simply deals with the almost forgotten question:—Are some of the ketones of enterogenous formation? Acidosis, as such, is, therefore, only mentioned in a casual way.

In many cases of acidosis beta-oxybutyric acid is found in excessive amounts. However, it is by no means the only low fatty acid that contributes toward the acid intoxication. The other members of this series, propionic, valeric, capric, enanthyllic, caprylic, pelargonic and caproic acids are probably as important in the production of acidosis as are the members of the butyric acid group themselves. Furthermore, besides acetone ( $C_3H_6O$ ), the ketone yielded by acetic or aceto-acetic acid, the ketones formed from the successive members of the fatty acid series, differing from one another by twice  $CH_2$ , undoubtedly participate in the production, or are concomitants of the clinical pictures that are erroneously ascribed to the acetone bodies or their direct progenitors. Such ketones are proprione ( $C_3H_{10}O$ ) yielded by propionic acid, butyrene ( $C_7H_{14}O$ ) from butyric acid, and valerone ( $C_9H_{18}O$ ), a product of valeric acid. The close chemical relationship of the successive members of the fatty acid series and that of their respective ketones, and the facts that they are, to the greater part, volatile liquids which are readily intermiscible and are subject to the same chemical reactions, give strength to the assumption that one member of the series of fatty acids or ketones may preponderate in a given case, but that it is hardly probable that these

single members are present to the exclusion of all the others. Originating in the organism from practically the same source or sources and being affected by the identical chemical influences, it is obvious why more than one of the lower fatty acids and more than one of their ketones are apt to occur at a time, and why the phenomena of acidosis, which are by no means invariable and uniform, must of necessity be the result of the conjoint activity, or be the concomitants of various fatty acids and various ketones.

It is probably true that there is no case of general acidosis in which acetone or its immediate forerunner, diacetic acid, cannot be demonstrated in the urine; this, however, is no conclusive proof that other ketones or their corresponding fatty acids are not found associated with the former. It is simply the readiness with which acetone and diacetic acid are detected in the urine that has given them a clinical prominence which, in reality, they do not deserve. Were the other ketones and fatty acids as easy of demonstration, the acetone bodies and their direct progenitors would not almost exclusively be held responsible for the production of acidosis.

While the occurrence of acetonuria may, therefore, furnish convincing evidence of an imminent or already established acidosis, it is in itself no proof that other members of the low fatty acid series have not participated in establishing this abnormal state, or that a ketone or ketones other than acetone stands at the foundation of the anomaly.

The question concerning us, however, is not that of acidosis but of the presence or production of ketones prior to absorption.

Hilliger<sup>1</sup>, and with him the modern clin-

ical school, is of the opinion that the liver is the place of formation of the acetone bodies. They assume that here they are probably generated as intermediary metabolic products which, physiologically, are almost entirely oxidized to  $\text{CO}_2$  and  $\text{H}_2\text{O}$ . Borchardt<sup>1</sup> had eight years previously maintained the same standpoint, namely, that the acetone bodies are intermediary metabolic substances, resulting when carbohydrates, glycosides and glycerine are withheld from oxidation.

There is little doubt, if any, that the bulk of the ketones that are produced after the stage of absorption are due to a certain form of hepatic insufficiency. That some of the ketones, however, may reach the intestinal tract in a preformed or nearly preformed state, or that they may be yielded and elaborated during pancreatic and intestinal digestion will be evinced in the following lines.

Some recent writers, particularly Howland and Marriott<sup>2</sup>, maintain that hyperpnea virtually spells acidosis. This is undoubtedly true. When there is an intestinal ketone formation and the liver is functioning properly, a ketonemia will either not ensue at all or, it will be so transitory and insignificant an occurrence that a hyperpnea will not be produced. In other words, ketones in the intestinal tract may give rise to various intestinal affections without concomitant ketonemia and hyperpnea. In fact, the confinement of ketones within the intestines is in almost every instance not followed by any evidence of intoxication or, for that matter, may not even result in any local clinical symptoms.

However, many diarrheal disorders, predominantly in childhood, are caused by the

<sup>1</sup> *Zentralblatt f. d. gesamte Physiologie u. Pathologie d. Stoffwechsels*, 1906, Vol. I.

<sup>2</sup> *Johns Hopkins Hospital Bulletin*, March 1916.

irritating activity of ketones upon the intestinal mucosa. To understand the untoward local influence of most of the ketones I wish to recall the abundant experimental and clinical work anent the fatty diarrheas, so-called. Accordingly, in intestinal ketone formation we have to deal with a vicious circle, i. e., a perverse disintegration of fatty substances in the alimentary tract on account of pancreatic or intestinal insufficiency, a local hyperemia, catarrh, etc., and a continuous irritation of the local process for reason of the continued perverse or increased elaboration of ketones from the volatile fatty acids. This vicious circle is only broken by withholding the foodstuffs that yield measurable quantities of ketones.

A fatty diarrhea is to all intents and purposes a ketone diarrhea, that is to say, it is not produced by the fatty acids of low molecular weight but, in some degree at least, by the ketones they have yielded. The ketone diarrhea, like the fatty diarrhea, may ensue without any systemic symptoms whatever. If it continues for more than thirty-six hours it is usually accompanied by loss of strength and body weight. In case it prevails for a protracted period, either in a continuous or the more common intermittent form, it is liable to give rise to marasmus and general atrophy. In the gravest types of atresia even it is unlikely that one has to primarily deal with an intoxication. Hyperpnea never supervenes in uncomplicated cases and is certainly not an evidence of enterogenously-formed ketones that have not penetrated the intestinal wall. In all these cases one is hardly justified in speaking either of a ketonemia or an acidosis. Ketonemia or acidosis may undoubtedly concur with enterogenous ketones; however, the clinical picture of intestinal ketonosis as such is due to the local action of the en-

terogenous ketones contained within the bowel.

Ketones, on the other hand, find their way very readily into the general blood stream. This is rather the normal occurrence when the liver does not sufficiently functionate to cause their physiological cleavage after they have been carried to the portal circulation. While in cases of acid intoxication the liver is the organ in and by which the acetone bodies are produced as intermediary metabolic substances and are not physiologically split up into simpler bodies in intestinal ketonosis when the ketones enter the alimentary tract either in a preformed state or are elaborated therein, the normally functioning liver is the principal line of defense against qualitatively or quantitatively abnormal intestinal substances.

**Symptoms.**—The symptoms of intestinal ketonosis are in a degree negative in character, but positive evidence is not missing.

**General appearance.**—The patient usually looks undernourished, weak and anemic.

**Diarrhea.**—Loose or watery discharges from the bowels are the rule. The reaction of the stools is always acid. They possess usually a butyric-valeric odor. When recently passed acetone may be contained therein. (Acetone in the stools may be detected in the following manner: The fresh feces are first well diluted with water, acidified with acetic acid, and then distilled. The distillate (10 c.c.) is treated with a solution of iodine in ammonium iodide; this results in the formation of iodoform and a black precipitate of nitrogen iodide. The latter gradually disappears on standing, thus rendering visible the iodoform. This test is reliable, as it excludes disturbing factors and sources of error like alcohol and aldehyde).

The stools may be macroscopically fatty,

but this is not necessarily the case. Mucus is of rather frequent, blood of infrequent, occurrence. The diarrheal attacks may alternate with more or less protracted periods of constipation.

*Ketonemia and Ketonuria.*—Absorption of ketones may take place, but ketonemia and ketonuria, when present at all, are most always of very brief duration.

*Hyperpnca.*—The amount of ketones which may be present in the blood at any one time is never sufficient to give rise to a hyperpneic condition.

*Ketones in the Alveolar Air.*—The alveolar air is free, or almost so, from ketones. The ketone odor emanates from the alimentary tract and not, as in ketonemia, from the lungs.

*Ketones in the Intestinal Gases.*—Ketones may be expelled with the flatus. Their presence can be demonstrated clinically by the sense of smell only. Of course, they are admixed with the other gases of fermentation and putrefaction. Proprione, butyrene, valerone and acetone are likely to occur in the flatus when their respective progenitors are found in the feces.

*Fever.*—Temperature elevation may or not be present. It may occur on one day, but may be absent on the next. In adults the eventual increase hardly ever surpasses two degrees F. In children below four or five years of age the rectal temperature may reach 104 to 105 degrees F.

*Pain.*—Abdominal pain is not always present; it is hardly ever of a severe type. This pertains to children as well as to adults. A pressure point sensitiveness is often found about the cecal region. In small children a scorching pain about the rectum and perineum is frequently met with. It is due to the irritating volatile acids and their ketones excreted in the feces.

The seat of production of intestinal ketonosis.—Normally the ketones are readily absorbed on account of their great volatility. At the bottom of intestinal ketonosis there must therefore stand either (1) an insufficiency of the lacteal system, or (2) the possibility that in intestinal ketonosis the ketones are not yielded until the residual ingesta, containing the lower fatty acids, have reached the large bowel. A number of clinical observations have convinced me that a structurally or functionally diseased cecum, hindering the free absorption of water, is the frequent seat of the formation and retention of enterogenous ketones. A few of the pertaining observations may here find mention.

*Observation I.*—Patient of Dr. Lack of Brooklyn. Married woman, twenty-seven years old, one child. Very frail. Undernourished and anemic. Penetrating valero-butyric odor from mouth when holding breath. The odor is independent from intake of food. Feces contain acetone as well as fatty acids and soap needles for a long period (two months). Occasional ketonuria. Chief complaints: Extreme prostration; diarrhea.

Examination: Nothing was found of pathological import, except cecal regurgitation and evidence of Jacksonian bands.

*Treatment.*—Operation by Dr. Lack. Removal of appendix and Jacksonian membranes; cecopexy. Complete recovery from intestinal ketonosis.

*Observation II.*—Married woman, thirty-eight years old, one child. Rather thin. Anemic. Rancid odor from mouth when holding breath. Feces contain valeric, butyric, aceto-acetic acid, acetone and large amounts of mucus. No ketonuria. Chief complaints: Restlessness; pain over course of transverse colon; diarrhea alternating with constipation; dryness in throat.

Examination: A cecum of great length and very movable was found.

*Treatment.*—Operation by Dr. Fischer. Removal of appendix. Cecopexy. Complete recovery from intestinal ketonosis.

*Observation III.*—Man, thirty-six years old. Present weight 142 pounds, but has lost over thirty pounds in five months. Aceto-

valero-butyric odor from mouth when holding breath. Odor is practically always present. No acetonuria. Feces contain fatty acids, soap needles and acetone. Chief complaints: Pain and soreness in left inguinal region; irritability; attacks of diarrhea.

**Examination:** By colonoscope no sign of disease of rectum and sigmoid discernible. Gurgling sounds in the cecum, pointing to atony of this part of the gut, are much in evidence.

**Treatment.**—Operation by Dr. Fischer. Removal of appendix. Cecopexy. Complete recovery from intestinal ketonosis.

I could recount a number of similar cases in which an intestinal ketonosis disappeared after the removal of the appendix, bands and adhesions about the cecal region and with or without cecopexy. In other cases, especially in nurslings and children, operative interference is not indicated. In these cases a rational change of diet is always followed by a suppression of the intestinal ketonosis.

**Sources of intestinal ketonosis.**—The mother substances of intestinal ketones are the volatile fatty acids. These volatile fatty acids are contained in milk and they form a goodly percentage of the fat of cow's milk, of butter and of some other milk products. Volatile fatty acids are also yielded as cleavage products of other fatty substances, of proteids and carbohydrates; however, the amounts thus obtained are very small, as a rule. It stands to reason that practically all the volatile fatty acids in bottle-fed infants are yielded by the milk-fats.<sup>1</sup> In normal adults on a mixed diet the amount of volatile fatty acids is rather insignificant, unless there be a distinct alimentary disorder. When put on a milk regimen or when an adult consumes large amounts of butter or certain cheeses, the volatile fatty acids will increase at once.

The entire secret, then, to overcome intestinal ketonosis in infants as well as in adults, consists in the withdrawal of the milk-fats and the substitution therefor of fats of higher melting point. Those who are interested in the pertaining details, I refer to my former writings on this subject.

<sup>1</sup> Besides, a certain proportion of the fecal acidity is undoubtedly caused by the intestinal microorganisms whose number and activity are often pathologically increased in many of the alimentary disturbances of infantile and adult life.

## ACIDOSIS IN SURGERY.

BY

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Surgeons who are well grounded in the principles of their special part of the profession have a fairly large death rate at the best when beginning practice. This death rate is gradually hammered down little by little. If one makes even one-half of one per cent progress each year, it counts for advance. Sometimes a newly arrived subject allows one to make better progress than one-half of one per cent of salvage rate in a year.

The study of focal infections has recently given surgeons an opportunity to lower their death rate considerably. They learned where to find and how to eliminate certain toxic influences which formerly caused recurrence of gastric ulcer and cholecystitis for example. The newer subject of acidosis hot from the laboratory furnishes another malleable utensil for all of us who try to feel that we are building in the daylight. Let us make a brief review of certain points in this connection.

Formerly acidosis was held to belong to the presence in the body of an excess of the so-called ketone substances, acetone, diacetic acid and one of the butyric acids. Very recently the biochemists have told us that we are to include among the acidosis cases, those with increased kidney elimination of ammonia which stands for an index to the degree of abnormal retention of acid somewhere in the metabolic cycle. We assume that this condition may result also when bases are lost from the body in morbid degree. Furthermore some kinds of acidosis may be associated with lessened kidney excretion of acids, and the failure of kidney

function which should allow acid phosphate to go over the threshold properly.

Crile has shown us that excessive display of emotion leads to temporary acidosis, and there is no doubt but an increase of the acid phosphate content of blood serum may be found by way of the laboratory in cases of many kinds of microbic interference with organic cell function. Just at present I am at work with a bacterium as yet unnamed which appears to be the acid malefactor in a case sent in with the question of duodenal ulcer. Arrest of development of the endocrinal glands or disturbance of the endocrinal glands in any way which disarranges the chromaffin machinery may result in acidosis. In the presence of hyperglycemia, hygroscopic sugar in the blood abstracts water from all body cells by osmosis, and interferes with the normal discarding of acid by-products in the course of daily biochemistry. We operate more safely in the presence of diabetes, after noting and eliminating the acid complication.

In surgery it is very important to know if the repair mechanism of the individual is efficient. We are at least called upon to determine the degree of efficiency of this apparatus so far as possible, in the interest of prognosis as well as in the interest of choice of procedure. For concrete example let us take a case of prostatic hypertrophy. If we give the patient a cubic centimeter of sulphophenolphthalein and if we recover 50% or more of this substance from the urine in the following two hours, we may know that in all probability the patient is eliminating his acid excretory matters well enough so that we may safely remove the prostate by the one stage operation. If this test allows us to recover only ten or fifteen per cent of the sulphophenolphthalein it is safer to do the operation in two stages, in the interest of a lower death rate.

In various septic infections where the patient is not doing well, and is found to include acidosis among his complications, the employment of sodium bicarbonate by means of the Murphy drip may correct the acidosis temporarily in such a way as to allow of a complete change in the picture in the course of a few hours. The employment of sodium bicarbonate in this way for the purpose of overcoming an acidosis is empirical if you please. It does not strike at the root of matters and eliminate the cause for the complication. It holds that particular morbid feature of the case temporarily in check in such a way as to allow the patient to gain better control with his defense organs, in the interest of a lower death rate for the surgeon's statistics.

The surgeon of to-day finds that some of the peripheral irritations appear to cause disturbance of the chromaffin system in such a way that acidosis results. By removal of such peripheral irritations as may be caused by eye strain, nasal hypertrophies, loose kidney or hemorrhoids for example a certain percentage of patients will make response which prepares them for better withstanding the effects of severe surgical work.

At the present time the surgeon employing his resources for the purpose of determining the presence of acidosis in advance of operative work, incidentally finds that by removing certain precipitating causes for acidosis the patient may not require any surgery at all—a given case of cystitis for example.

In the surgery of to-day we have to take plenty of time for putting the patient through the laboratory whenever it is possible to do so, and to make up a brief of a case very much as a lawyer makes up a brief before presenting his case in court. In making up our briefs of various surgical conditions we are obliged at the present day

to determine the degree of acidosis which is present in any given case, if we wish to lower our death rate little by little in accordance with the opportunities which are furnished by the newer knowledge of the day.

616 Madison Ave.

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## CECAL STASIS WITH BETAIMINAZ- OLYLETHYLAMINE (HISTAMIN) INTOXICATION IN RELATION TO DEMENTIA PRECOX; IN- DICTIONS FOR TREAT- MENT.

BY

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The State Charities have no greater problem than the care of the youthful insane. The Board of Administration in Illinois, for an example, expends forty per cent. of the total State Budget on the insane, the epileptics, and wards of the State. Of the 14,000 insane in Illinois at least sixty per cent. are dementia precox patients. The average life of a patient after commitment with this disease in the State of New York, is fifteen years. The average cost to the Board of Administration for each patient is three hundred dollars a year, or \$4,500.00 for life.<sup>1</sup> In the entire United States not less than fifteen thousand youths are committed to the State Hospitals each year with this disease, and as many more are kept in private institutions or at home.

The etiology of this disease, its pathology and methods of treatment are equally

undecided. During 1914 and 1915 no book with "dementia precox" in its title was published in the English language. In spite of the fact that 120,000 patients are in the custody of the several states and must be maintained at a cost of not less than thirty-six million dollars a year, no state in the Union has made any research or established any commission or laboratory for this purpose. The first move in this direction was made last December when the Board of Administration of the State of Illinois entered into an agreement with the Otho S. A. Sprague Memorial Institute to establish a cooperative research laboratory. This laboratory will be at the Chicago State Hospital and will be devoted to the study of dementia precox. This is the first promised laboratory for research into the causes of dementia precox ever established in the world and it is the first time that a State Board of Administration has undertaken to cooperate in so worthy an object with a richly endowed foundation designed, in the words of its charter, "to relieve human suffering." Its success is now in the hands of the director of medical research, Professor H. Gideon Wells.

The fate of the previously established general institutes and undertakings, like those of New York, Michigan and Illinois, ought to determine this new aggregation for a specific purpose to optimistic, enthusiastic, and liberal endeavor. A new devotion should inspire every American citizen, and not least of all should it inspire our academic, scientific, and research men.

During the past eight years it has been my sad part in medical affairs to study this terrible disease and attempt to arouse the keepers of the insane to a mechanistic interpretation of the symptoms offered by their 120,000 patients. This great body of

<sup>1</sup> LaMoure, Chas. T., A study of the statistics of the New York State Hospitals for 1913 with special regard for statistics regarding dementia precox. *Bost. Med. and Surg. Jour.*, 1915, CLXXIII, 744.

administrative experts are agnostic and pessimistic when they are consulted about this condition and their attitude of mind toward the insane adolescent casts an added shadow on the custodial asylum to the parent "putting away his son or daughter." The literature of psychiatry is equally gloomy in spirit. A large group of German and many American professional psychiatrists look upon dementia precox as "psychogenetic," originating in the mind, or the result of a "twisted idea" and some of them would cure it by "psycho-analysis."

At first my studies were confined to the literature of medicine but, later, opportunities were afforded me for making clinical and, with the cooperation of Julius Retinger, Ph. D., and other chemists, a few laboratory studies. These have been published as rapidly as possible in order to encourage others to begin similar studies and with the hope of arousing someone better trained and more favorably situated to undertake other investigations more adequate for the relief of the 120,000 helpless dementes than any I could myself conceive or contrive.

In this article the same motive is paramount, but I wish to describe as fully as possible my attitude toward this disease and to present, in one perspective, the evidence which has compelled me to take this position.

During the early years of my study, the evidence of the clinical course and the inexorable termination of the disease were firmly associated in my mind with toxemia. The scant pathologic morphology in the brain which all histologists have recognized, was soon over-shadowed by and lost in, the gross lesions of secondary infectious processes (Omorokow). Tuberculosis, the inevitable result of congregate custody, was

the most conspicuous. This made the study of early cases necessary. But there were characteristic lesions in remote parts of the body in the few cases adequately studied by modern methods. The defensive ferment reaction demonstrated a "dysfunction" of the sex glands and many other glands of internal secretion which pointed to local infectious processes with constitutional toxemia.

Such reactions were not found in the blood serum of seventy lodging-house tramps which I personally examined. The testicles were devoid of living spermatozoa in a large number of patients autopsied by Todde<sup>1</sup> after sudden, violent death. In six private dementia precox patients, under my protracted personal observation, the contents of the seminal vesicles were repeatedly examined microscopically without the discovery of a living spermatozoon, although, on chemical examination, the fluid contained spermine. The pulse was generally slow and the blood-pressure was always low, 110 or under, and injections of adrenalin (0.5 c. c.) did not raise it, but on the contrary usually caused it to fall (Willi Schmidt<sup>2</sup> reaction). The instillation of adrenalin solution into the conjunctival sac caused the pupil to become excessively dilated within ten minutes, the same as if the patient's sympathetic had been severed above the superior cervical ganglion (Schultz<sup>3</sup> reaction). The disease whether acute or chronic is character-

<sup>1</sup> Todde, Carlo, Richerche sulla funzione e sulla struttura delle ghiandole sessuali maschili nelle malattie mentali. *Riv. sper. di Fren.*, 1914, xl, 233.

<sup>2</sup> Schmidt, Willi, Adrenalin unempfindlichkeit der Dementia precox. *Münch. med. Woch.*, 1914, lxi, 366.

<sup>3</sup> Schultz, J. H. Beiträge zur somatischen Symptomatik und Diagnostik der Dementia precox. *Monat. f. Psych. u. Neur.*, 1915, xxxvii, 205-227.

ized by exacerbations and remissions, but the succeeding plateaus or mesas of stationary symptoms fall lower and lower each time and the patient gradually sinks into dementia. The blood is often highly concentrated, 8,000,000 red corpuscles or more with leucopenia, 6,000 or 8,000; and these fluctuations are sudden and excessive and correspond with the changes in mental conditions (Kahlmeter<sup>1</sup>). The extremities are often cyanosed and cold and the veins of the lids and abdominal wall are often greatly enlarged thus reminding one of ergotism.<sup>2</sup> The tongue is also swollen or hypertrophied and it fills out the mouth, holding the jaws open and often pressing the teeth forward and outward. In spite of every effort with toothbrush and powder the teeth decay rapidly and the gums retract. There is a condition of catatonia and evidences of spasmophilia. Osteomalacia is frequently present and skigraphs, even early in the disease, show rari-fied bones resembling those of osteomalacia. There is a myocarditis and this may be so advanced that rupture of the heart occurs spontaneously during a disturbed period. These two conditions, osteomalacia and myocarditis, result in frequent legal complications between attendants and the friends and keepers of the insane.

*The adrenalin paradoxes which are manifest in dementia precox patients are similar to the reaction of animals or human beings, who have been intoxicated with ergot or with the toxic amines which are responsible for the physiological action of ergot. The*

activity of ergot is due to four or more toxic amines which have been well studied and our interest in them came from the therapeutic prominence of ergot in labor.

It was this fact that led me to secure the assistance of a chemist, Julius Retinger (Ph. D., Leipzig 1913), to see if these amines were present in the blood, the urine, and the feces of such patients as exhibited these paradoxes. There are many toxic amines resulting from the bacterial catabolism of amino acids and those have been most studied which result from catabolizing tyrosin, tryptophan and histidin. From a media containing tyrosin the colon bacilli are able to produce p-oxyphenylethylamine, or ergotoxins, from one containing tryptophan they produce indoethylamine and from one containing histidin they produce betaiminazolylethylamine or histamin as it is called for short. All of these amines and several others are found in ergot. The first and second raise the blood-pressure, the last one causes it to fall. The first and second contract the arterioles of the systemic circulation, and the last one causes the same arterioles to dilate. The first and second produce little change in the bronchioles of the lungs, the last causes them to contract violently. The first and second have no action on the muscles of the sexual apparatus, the last causes them to contract violently.

The injection of 0.5 c. c. of adrenalin (1:1,000 solution) into the deltoid muscle of a woman who has received a full portion of ergot is followed by a fall of blood-pressure.

*An animal or human being intoxicated with any one or with all of these amines reacts paradoxically to adrenalin just as dementia precox patients do.*

Patients with gastric crisis of tabes have

<sup>1</sup> Kahlmeter, Gunnar, Blodundersökningar vid ett fall af dementia precox med periodiskt förlapp. Nord. med. Ark., 1914, xvi, Afd. II, p. 1-29. English Translation by Carlstrom, Chas. O., Chi. Med. Rec., 1915, xxxvii, 206.

<sup>2</sup> Kolosow, G. A., Geistesstörungen bei Ergotismus. Arch. f. Psych. u. Nervenkrankheit, 1914, III, 1118.

a low blood-pressure and they present the adrenalin paradoxes of the pupil (when motile) and of the blood-pressure. They are at once relieved of their pain by the injection of 0.5 c. c. adrenalin solution 1:1,000,<sup>1</sup> and borborygmus appears in the abdomen during the following sleep.

It was Taube who first showed that tabes did result from chronic ergotism.

Hypothesizing from the adrenalin paradoxes the possibility that dementia precox patients were intoxicated with the toxic amines and finding that the reactions of animals to one of them, the betaiminazolylethylamine, were very similar to the symptoms of dementia precox, I reviewed the literature of medicine to discover if any one had sought for these amines or the products of their catabolism in the blood of the body or in the secretions.

Ross<sup>2</sup> studied the urine of dementia precox patients for indol-acetic acid and indican, the end products of indoethylamine, the least toxic of the three best known toxic amine bases. He found the "endogenous" portion of the amine constant even on a tryptophan-free diet, and estimated that this factor was four times as large a constant as he found in normal and other sick individuals. Indoethylamine is easily recognized in the stool and by colorimetric methods. It can be readily measured but I have not yet found any studies of its appearance in the stools of dementia precox patients.

Indoethylamine is easily recognized in

the blood by the Obermeyer-Jolles<sup>1</sup> methods, but it is such a common finding that it cannot have a great significance. Betaiminazolylethylamine cannot be readily recognized in the blood. The oxytocic method has not so far been made available for the purpose. It is uncertain in what form this amine appears in the urine, if it appears there at all. It is possible that it is all carried away in the bile. Presumably it is dissociated by the liver. It remains, therefore, to look for betaiminazolylethylamine in the stool where some of it may be entangled.

In my studies with Dr. Julius Retinger we found in 100 grams of the stools of dementia precox patients loads of betaiminazolylethylamine varying between 0.5 and 0.05 mg. and recognized it by the Eustis-Eppinger<sup>2</sup> skin reaction and the oxytocic method (virgin guinea-pig's uterus).

The action of bacteria on amino acids in vitro, always gives a complex mixture of substances. Generally the two major products are the unchanged amino acid, and the amine produced by the decarboxylation of this acid; but other products also appear, often in very large amounts. For example, histidin, when acted upon by bacteria is only partially decomposed. We find at the end of a week or so, perhaps fifty per cent. of unchanged histidin, and perhaps thirty per cent. of histamin. We still have twenty per cent. of material to account for, whose exact character is still unknown. The same holds true for all the other amino acids that have been

<sup>1</sup> Holmes, Bayard, The adrenalin reaction in gastric crisis of tabes and the significance of betaiminazolylethylamine in the feces. *Lancet-Clinic*, 1915, cxiv, 392.

<sup>2</sup> Ross, E. L., The source of urinary indol-acetic acid in two dementia precox patients. *Arch. Int. Med.*, 1913, xii, 231.

<sup>1</sup> Jolles, A. Beitrag zur volumetrischen Harnstoffbestimmung. *Biochem. Zeit.*, 1913, lvi, 414. et Jolles, A. & Schwenk, E., Zur Darstellung des indoxylschwefelsauren Kaliums (Indican). *Biochem. Zeit.*, 1915, lxviii, 347-49.

<sup>2</sup> Eustis, A., Urticaria, an experimental lesion produced by the local application of betaiminazolylethylamine and its relation to intestinal toxæmia. *New Orl. Med. and Surg. Jour.*, 1914, lxvi, 730.

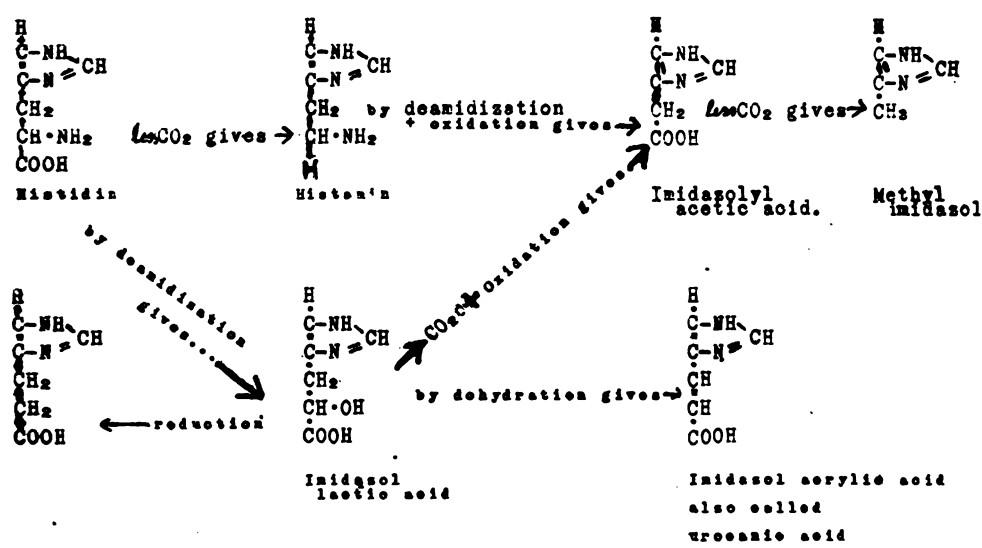
studied. In some cases, the chemical character of a portion of the by-product has been determined. Thus in the case of histidin, small amounts of imidazolylpropionic acid were found by Ackermann.<sup>1</sup>

Theoretically, at least, it seems not improbable that a great many substances might be formed here. These bodies would not be diamines like histamin, but they would still contain the imidazol group with its basic nitrogen. When working with mixtures from which these by-products have not been carefully excluded, it would certainly be unwise to draw any dogmatic conclusions from a biological reaction, as to the presence or absence of histamin, until all the possible intermediate bodies have been synthesized, and their biological activity studied. In our work we were obviously compelled to use biological reactions only, in testing for histamin. The Eustis-Eppinger skin test, and the oxytocic test, which is based upon the powerful contractions produced in a virgin guinea-pig's

uterus by very small traces, 1 = 250,000-000, of histamin, were the two tests employed. Some of the estimations were made by Parke, Davis & Co. for control. Positive reaction was always reported in the stools of dementia precox patients, and a negative result in normal cases.

These biological reactions, inconclusive as they may be because of our lack of biological information, are nevertheless far superior to the known chemical color tests for histamin, such as Ehrlich's diazo reaction, because the latter tests are most certainly given by all bodies containing the imidazol group. It is, on the other hand, unlikely that so powerful a biological reaction as is shown by histamin should also be due merely to the imidazol ring, and hence should be shown by all of its derivatives.<sup>2</sup> Histidin, which contains the imidazol ring, is biologically non-toxic; nevertheless, no exclusive conclusions can be drawn until all the possible intermediate products have been synthesized and their biological activity studied.

The following chart indicates the possible by-products in the action of metabolism, bacterial or otherwise, on histidin:



Of the foregoing products, the last two, imidazol lactic acid and urocanic acid would be very improbable findings, because they represent intermediate stages that the normal metabolism can rapidly carry farther. They must be considered as possibilities, however, because urocanic acid has actually been isolated from dogs' urine. Products, beside the histamin, that would be very likely to appear are, imidazolyl propionic acid, which has actually been found in putrefaction mixtures by Ackermann, imidazolyl acetic acid and methyl imidazol. We would really expect, since the end products of metabolism of tyrosin and tryptophan are p-oxyphenyl acetic acid, and indol acetic acid respectively, that the end product of metabolism of histidin would be imidazolyl acetic acid. As far as we know, all the above products have already been prepared synthetically, it only remaining to repeat these syntheses and try the biological action of each of the products in turn.

Entangled in the stool of seven patients with dementia precox of three months' to three years' duration we found measurable quantities of the amine bases. Of course only mere chips of the original load of amines could be expected to remain in the stools. Our experience with indoethylamine which is so readily recognized by the colorimetric method of Obermeyer-Jolles, taught us to be cautious in measuring a toxemia by the amount of toxin in the stool. The absence of the betaiminazolylethylamine in the stool would not, so we premised, be a contraindication to a betaiminazolylethylamineaemia but its presence and its detection and measurement would be almost conclusive of such a condition. We found in the stools of dementia precox patients, and other patients

with adrenal paradoxes loads of betaiminazolylethylamine.

The question naturally arises how and where is this toxic amine of such depressant power over the blood-pressure generated? Fortunately much data for the answer has already been obtained. This toxic amine has been found in the intestinal mucosa. There Barger and Dale<sup>1</sup> found that it imparted a "depressor action" to the secretin with which it was mixed, but here the quantity is so small as to be negligible. It is also produced by the growth of bacilli of the colon group upon a media containing 0.5 per cent. histidin. The small intestines pour out into the cecum this and twenty other amino acids and the colon is always full of microorganisms of the colon group.

It seemed desirable, then, to study the motor activities of the intestinal tract of such dementia precox patients as gave a paradoxical reaction to adrenalin and had the venomous betaiminazolylethylamine in the stool. The few cases available to us for this examination<sup>2</sup> were each given the liquid barium meal and studies were made at six and twelve hour intervals for a period of five days. Patients were examined directly with fluoroscope and skiagraphs were sometimes made for records. It is sufficient to summarize the results of these examinations as follows.

1. No considerable delay in the stomach and small intestine. The barium meal in the cecum in every case at the six hour seance.

2. Great delay in the cecum. The tail of the meal never leaving the cecum earlier

<sup>1</sup> Barger, G. & Dale, H. H., Betaiminazolylethylamine, a depressor constituent of intestinal mucosa. *Jour. of Physiol.*, 1910, xli, 499.

<sup>2</sup> To any one who recognizes the difficulty of fluoroscopic examinations of insane patients, the fact that we report only seven such acute cases will not be held up to us as a fault.

than the sixty hour seance and often as late as the one hundred and twentieth hour seance.

3. Rapid passage of the slowly discharged barium meal through the distal colon to the sigmoid and rectum. Distal colon generally dilated with gas and containing only small residues of meal in transit.

4. A reduplication of the hepatic portion of the transverse colon and excessive constriction of the colonic sphincter at the junction of the proximal and distal colons.

5. Vigorous antiperistalsis of the proximal portion of the colon and cecum.

In other words the seven cases of dementia precox and the single case of gastric crisis in tabes gave evidence of *spasm of the colonic sphincter and exaggerated cecal stasis*. This condition gave time and opportunity for the development of the betaminazolylethylamine in the cecum where all the conditions were ripe for its production; the histidin was constantly poured into the cecum, the *Bacillus aminophilus intestinalis* of Bertrand and Berthelot<sup>1</sup> was there, the temperature was always 37° C., the antiperistalsis kept the media mixed, the rapid absorption of the mucosa of the cecum and hepatic portion of the transverse colon carried the toxin over into the blood, the lymph, and the portal circulation and the little masses of solid residue were passed through the colonic sphincter impregnated with the toxins and hurriedly passed through to the sigmoid and rectum through a mucous canal which has very slight absorbing power.

It will at once occur to anyone that these meager and impoverished researches have demonstrated too much. Consider for a moment that the betaminazolylethylamine

is the most toxic ingredient of ergot and that there have been many extensive epidemics of chronic ergot poisoning during the past centuries covering nearly the whole of Europe; and that Russia, during the past ten decades, has rarely been free from an epidemic of ergotism somewhere in her enormous domains. How is it possible that mental disturbances are not mentioned in connection with our historic accounts of these epidemics?

This is the answer. Our test-book histories are not complete. Mental symptoms are prominent in one-fourth of all cases of ergotism. Emphasis, however, has been given to the pharmacologic action of ergot as ordinarily understood by us, to the abortions and to the necrosis of extremities, but the ancient accounts and the modern monographs do not neglect to mention the frequency of mental disturbances and the fact that after an attack of ergotism no patient is ever quite as bright as he was before. In one of the most recent articles on the subject, G. A. Kolossow of Smolensk, Russia, (vide page 407, note 2) has given a review of the Russian literature. It is conclusive on two particular points from observations during epidemics as late as 1910. Mental deteriorative psychoses not unlike dementia precox are present in twenty-seven per cent. of all cases of epidemic ergot poisoning; and posterior spinal sclerosis, parallel to clinical tabes dorsalis of syphilis, occasionally appears.

The fact has been noted for many years that patients with dementia precox are generally improved in mental condition and even occasionally recover after an attack of typhoid fever or other febrile disease. If we take into account also the indubitable benefit of subcutaneous injections of sodium

<sup>1</sup> Berthelot & Bertrand, Sur quelques propriétés biochimiques du *Bacillus aminophilus intestinalis*. *Compt. rend.*, 1912, cliv, 1826.

nucleate in dementia precox we find both observations elucidated by the fact that the *Bacillus aminophilus intestinalis* does not produce betaiminazolylethylamine except at 37° C. and at a higher or lower temperature no toxin is produced.

It is hardly possible to believe that the few experiments which I have been able to make can do more than stimulate those better equipped and better situated to pursue this promising lead. There are many amino-acids poured into the cecum after each meal. Each of them is capable of being so modified as to produce one or more bases. Some of them are toxic, others perhaps synergistic to the most toxic of the others; perhaps antagonistic to one while synergistic to another, thus complicating the clinical picture. We know only one of the bases derived from histidin, but two or more far less toxic ones are derived from tyrosin.

In further researches, the results of these meager investigations must be either confirmed, refuted or modified. If they are confirmed doubtless the variations which some patient will present to the simple category here followed out, will lead to researches of a tributary or more radical nature. The hypothesis which is usually held (Eustis) that the liver is able to catabolize the toxic amines could not be utilized with betaiminazolylethylamine because none of the catabolized products of histidin except betaiminazolylethylamine have yet been produced and studied. The end products of tyrosin and tryptophan have, however, been thoroughly investigated.

Since the conditions under which tyrosin and tryptophan are dissociated into p-oxyphenylethylamine and indoethylamine are similar to those under which histidin is changed to betaiminazolylethylamine, these

three bases are likely to appear together. This gives rise to two interesting conditions. The "pressor" action of the first and second bases modify the "depressor action" of the last. The same may be said of other antagonistic actions. There are probably many yet unrecognized bases accompanying each of these three that are synergistic or antagonistic in their several actions. It may be that the toxic amine which acts most powerfully upon the brain is not the venomous betaiminazolylethylamine at all but some yet unknown imido base or other unknown or unnamed derivative. It is easy to write the formula of these bases and no doubt they can be synthesized and their physiologic action and chemical reactions studied. This should be done.

The second interesting possibility that presents itself has to do with the easy recognition of the phenyl and indol bases as compared with the imido bases. The presence of the indol bases and their quantities and reactions might give some clue to the quantity of bacterial catabolism of amino acids in general. With this criterion the studies of Ross on the excretion of indolacetic acid and indican in the urine have added significance.

Our examinations of the stools for betaiminazolylethylamine have not satisfied the chemical, as well as they have satisfied the clinical requirements of the case. The depressor amine bases (of which betaiminazolylethylamine alone is known) were in the stool in large quantities, quantities large enough to kill a 300 grm. guinea pig in a few minutes. The symptoms manifested by the patients are similar to the experimental reactions of animals when injected repeatedly in non-lethal but toxic doses. The evidence presented is sufficient to warrant the institution and practice of

a rational therapy based on this biochemical pathology. It is not wise nor humane to wait for a demonstration that will be impregnable from an academic standpoint before this first rational suggestion for a promising therapy is offered to the otherwise hopeless army of fifteen thousand American youths marching into the asylums each year to a scant fifteen years of "let-alone" custody before death releases them.

If such therapeutic measures as this criterion suggests for the arrest of the toxin production in the cecum should be successful, the effect on the patient would still be problematic. There is hope, however, in the remarkable remissions which patients long catatonic, or long inactive and apparently demented exhibit spontaneously, or show as the result of infectious diseases or following the sodium nucleate treatment of Lundvall.<sup>1</sup> If the traditions of psychiatrists are to be taken seriously *some few cases of dementia precox actually recover.*

It is not at all unlikely that anaphylaxis comes in as a large increment in the dementia precox problem. This toxic beta-aminazolylethylamine has long been associated with the symptoms of death from horse serum anaphylaxis. This toxic amine base causes a most violent contraction of the muscles of the bronchioles and probably has much to do with certain forms of asthma, especially those that are relieved by intramuscular injection of adrenalin.

The presumption of simplicity which it is necessary to carry out in an article of this kind which is merely one projection, to use an architectural term, of the subject, will not of course be sustained when the great residue of the disease, numbering more than

120,000 now in custody, are submitted to this pathogenic criterion.

If dementia precox patients are intoxicated from amines produced in the cecum as a result of spasm of the colonic sphincter, then there ought to be the same consideration in this disease for the condition known as spasmophilia as is accredited to it in spasms of the pylorus or in spasm of the cardia. One of the excretions in the urine long known to be disturbed and fluctuating in dementia precox is the calcium fraction. The treatment of the spasm of the sphincter or of the colon, whether resulting in dementia precox or in other less serious manifestations should follow the experience which has come from the treatment of spasm of the pharyngeal sphincter, spasm of the cardia, spasm of the pylorus, and spasm of the rectal sphincters. (Herter's infantilism and Hirschsprung's disease).

The treatment should be directed to the prevention of the production of the toxic amines in the cecum or to their rapid removal. *Until further research has developed a simpler method, this can be best and most certainly done by appendicostomy with protracted irrigation of the proximal colon through this artificial opening, and this is what our study indubitably directs.*

**Charcoal in the Treatment of Membranous Enterocolitis.**—Roidet (*Jour. de Medecine de Paris*) reports excellent results following the treatment of this usually intractable condition by means of large doses of poplarwood charcoal. From two to four tablespoonfuls of the latter are given daily, mixed with water and administered after the midday and evening meals. The efficacy of this remedy is said to be due to its power to absorb gases from the stomach and intestine, to its antiseptic effect, and to its action in stimulating the contractility of the stomach.

<sup>1</sup> Lundvall, H. Blood-changes in dementia precox and artificial leucocytosis in its treatment. *Am. Jour. Clin. Med.*, 1915, xxii, 115.

## ACIDOSIS, CLINICAL NOTES AND THERAPEUTIC SUGGESTIONS.

BY

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Acidosis has been defined by Cautley as an abnormal metabolism of carbon leading to the appearance of organic acids in the blood and urine, and the formation of ammonia to neutralize these acids.

According to Rhamy these organic acids, beta-oxybutyric and diacetic, with acetone, comprise the acetone bodies. It has been said that oxybutyric acid is the precursor of diacetic acid and acetone the final product of the series; yet there is no good reason for so believing, except the order of their appearance in the urine, the similarity of their chemical formulas, and the fact that diacetic acid, when heated, changes to acetone. Against this view is the fact that acetone can readily be formed from a number of other substances. Furthermore, the administration of sodium acetoacetate is followed by the elimination of beta-oxybutyric, just the reverse of the common understanding of their order of formation.

"The processes by which fat is burned are dependent on the simultaneous combustion of carbohydrates. The acetone bodies are probably excreted as a result of a lessened oxidation of fat, brought about either indirectly as a result of lessened sugar combustion, or by a direct influence of some unknown nature of fat combustion." (Howland and Richards).

Rhamy finds that acetone bodies constantly appear in some lesions of the pancreas, which fact, too, is in accord with the intestinal origin of some cases of acid intoxication, since disturbances of pancreatic

function would reduce digestive activity in the duodenum with resulting faulty cleavage of fats. We know that acetone is found in very small amounts in the urine of healthy children, never exceeding 1 cg. in twenty-four hours (Langstein and Meyer). Acetone and its associates, diacetic and oxybutyric acids, are possibly being constantly formed in minute quantities in normal metabolism.

Reiche found acetonuria present in 60 per cent. of a series of thirty-two hundred diphtheria cases. Their occurrence has been noted in scarlet fever. In children it is invariably true that acidosis in the body is accompanied by an increase in the excretion of ammonia.

Rachford has suggested that the acids, besides removing alkaline bases which are needed in metabolism, have a direct toxic action in that they bring poisonous alkaline bases (as ammonia) into the blood. Ewing, too, from his experimental work, has concluded that the intoxication may be due to the accumulating antecedents of urea. He adds that none of the principles of the theory of acid intoxication have been proven—namely, carbon dioxid asphyxiation, degeneration of the vital organs by withdrawals of alkalies and reduced alkalinity. This would lead us to believe then, that the acetone bodies are derived from fatty acids imperfectly metabolized in the liver; that this imperfect metabolism may be coincident with lessened sugar combustion; but that there is an immediate exciting cause for this imperfect metabolism.

Frederick Taylor defines acidosis as the occurrence of certain organic acids in abnormal amounts in the blood and urine. Beta-oxybutyric acid is the chief body present, diacetic acid and acetone being derived from it by oxidization.

There are several types of acidosis. In the one imperfect metabolism of fat with lessened sugar combustion in which acetone bodies most likely arise from fatty acids. Thus may be formed a gastric or gastrointestinal type of acidosis.

Another type is the one met with during the acute exanthematous diseases as well as diphtheria, scarlet fever and pneumonia.

A third type is noted after poisoning by phosphorus, salicylates and similar drugs; shock, fright, poisoning associated with anesthesia and appendicitis.

A tendency to the development of this condition exists in many children. As a rule they are high-strung, nervous, hypersensitive children of the so-called neurotic type. Whether or not the neurosis inhibits the proper functions of the peptic glands, the pancreas, and the liver is hard to determine although it seems plausible. We are positive that the internal secretions as such, are modified in quality or quantity thus permitting an imperfect or incomplete digestion to take place. In consequence there is a stagnation and irritation caused by the gastric and intestinal contents from which imperfect metabolism results. The imperfect metabolism permits putrefactive bacteria to interfere with the assimilation of food, thus will begin a train of symptoms resulting from intestinal fermentation with excessive acid formation.

The breath of a child suffering with this condition has a peculiar sweetish odor. As a rule the tongue is dry. There is a deficiency in the quantity of saliva secreted. As with the peptic glands so the salivary glands do not properly functionate. The urine is acid. From the fever there is usually a trace of albumen. Acetone is present in a very large amount, diacetic acid also is found. The symptoms are those

which would appear to be one of gastric indiscretion, and will show vomiting and high fever, the temperature ranging between 102 and 104 degrees F. The pharynx is reddened, the tonsils appear swollen.

These cases occur in children where there is strict supervision of the diet. We can rule out improper food as a causative factor because these attacks will occur every three or four weeks in distinct cycles. Many of these cases have been improperly designated as cases of "cyclic vomiting."

*Mild Attack.* Acidosis may be a primary condition, that is, a child may be in apparent health and have a sudden attack of this condition without any previous gastric derangement due to imprudent diet. On the other hand acidosis may be secondary to an attack of tonsillitis or may complicate measles or any of the acute infectious diseases. Acidosis may frequently follow etherization.

*Severe Attack.* When the attack is severe we have a stuporous or even a semicomatose condition. The eyes appear sunken and have dark circles about them. Profound toxicity can be noted. Such children appear to be in a typhoidal state. Vomiting is more pronounced in severe cases and the smallest quantity of food and water will not be retained. The urine is scanty and high colored. Tenderness over the stomach and in the abdomen is frequently present to such an extent as to mislead one in the diagnosis of a probable appendicitis. The vomiting, fever, and stupor have frequently lead to the diagnosis of meningitis being made, but the acetone odor to the breath, and the frequent recurrence of these attacks will differentiate this condition from one of meningitis. The pupils are normal and respond to light. The reflexes may be slightly exaggerated or

otherwise normal. There is no rigidity of the neck, neither is there a Babinsky nor a Kernig present. The Tâche-Cérébrale is rarely present, and if so in a very mild form. Lumbar puncture if made will yield a clear transparent fluid in which no micro-organisms can be demonstrated.

The stool contains mucus and sometimes undigested particles of food. Occasionally the stool will be streaked with blood.

The following case will illustrate the form of acidosis usual met with in well regulated families.

*Case 1.* B. N., aged four years, had had measles, tonsillitis, otitis, bronchopneumonia and several attacks of influenza. He was a bottle-fed infant, with deficient glandular secretion, an inactive liver, marked coprostasis, and hard dry, scybalous stools, requiring laxatives almost daily for months. There was a general atony of the gastric and intestinal canal, with loss of appetite and deficient intestinal secretion as evidenced by the dry stool.

With the aid of general restorative treatment and continuous dieting, the child progressed favorably. He was normal mentally and his physical condition was up to the average. He was markedly neurotic, very sensitive, but a well balanced child otherwise. There were no stigmata nor hereditary conditions which could influence his presence condition. Both father and mother were in good health. There was no taint of specific disease.

Despite continuous dieting, great care and supervision, with excellent hygiene, this child will now have, without evidence of gastric indiscretion, a sudden attack of anorexia, vomiting, a total refusal of food, and temperature ranging between 101° and 103° F. The pharynx is reddened, the tonsils are swollen, and after the second or third day the lacunae will be filled with pin point deposits.

Bacteriological examinations made at least six times during these attacks, have shown the presence of *staphylococcus pyogenes aureus* and an occasional *streptococcus chain*, but never the *Klebs-Loeffler bacillus*. The urine is characteristic.

The following analysis was made on the second day of illness during one of these febrile attacks, and after the child had had three attacks of vomiting during the forenoon.

#### ANALYSIS OF SPECIMEN OF URINE, REPORT NO. 59,831.

Reaction, acid. Sediment, very moderate. Nature of sediment, heavy. Albumin, faint trace. Bile pigment, absent. Urea, 1.2 per cent. by weight. Indican, no excess. Color, amber. Odor, not offensive. Specific gravity, 1,022. Sugar, negative. Acetone, large amount. Chlorides, 1 per cent. by weight. Phosphates, no excess. Diacetic acid, traces.

*Examination of Sediment.*—Blood, none. Pus, none. Mucus, small amount. Casts, none found. Bacteria, no apparent bacteria. Epithelium, few bladder cells.

*Summary.*—The specimen contains a faint trace of albumin, but no casts were found, with a normal gravity, and a considerably depressed relative amount of urea.

A large amount of acetone and traces of diacetic acid are present.

FREDERICK E. SONDERN.

The examination of the urine shows that there is a large amount of acetone, traces of albumin, and traces of diacetic acid. The casual study of many cases would lead one to believe that the gastrointestinal canal is responsible for these attacks. When the throat is carefully examined, however, we always find that deep seated, submerged, swollen tonsils are at the root of the trouble. Many of the patients suffer from inanition owing to these recurring febrile disturbances which deplete the body.

The following will illustrate a severe form of acidosis:—

*Case 2.* J. G. Six years old was seen with Dr. Gingold. The child complained of abdominal pains which were diffused over the stomach and colon. There was moderate distention, tenderness on pressure over McBurney's point, marked prostration, sunken orbits, and dark rings encircling the eyes. The child appeared typhoidal. All food, drinking water and medication were

vomited. The stomach retained nothing. The urine contained acetone and diacetic acid.

There was a moderate leucocytosis of 12,100 polynuclears 57 per cent. The highest temperature curve was 105.4 degrees, pulse 160, respiration 30. There was a distinct acetone odor to the breath. An intravenous injection of sodium bicarbonate was given. The following day the temperature dropped almost four degrees.

The case well illustrates the specific action and the rapid effect of the bicarbonate of soda solution when given intravenously.

Acetonuria is invariably present as long as the urine is acid. The acetone usually disappears a few days after the urine becomes alkaline.

Abt reports<sup>1</sup> an unusual type of acid intoxication in a breast-fed infant. The treatment consisted in weaning the baby from the breastmilk, giving rectal infusions of 8 per cent. glucose in normal salt solution, large doses of sodium bicarbonate by mouth or whisky or sour wine in half dram doses every two hours, powdered casein in half-dram doses on oatmeal gruel every two hours, soy-bean soup three times a day, occasional oxygen inhalations when cyanosis and dyspnea were most marked; and the subcutaneous infusion of sodium bicarbonate. Two per cent. levulose and sodium bicarbonate were given by mouth. The patient made a complete recovery.

Potassium citrate and sodium citrate used in conjunction with the sodium bicarbonate or alone serves very well. One ounce of citrate to four ounces of water. By giving one-half drachm or one drachm every hour the urine can be rendered alkaline in less than twenty-four hours. But it is necessary to continue the alkaline treatment for several days after the acidity of the urine has disappeared.

<sup>1</sup> Amer. Jour. of the Medical Sciences. Jan., 1914.

## DIABETIC ACIDOSIS.

BY

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Any increase of acidity, or of H-ion concentration, of the blood is an acidosis. Both volatile acids ( $\text{CO}_2$ ) and nonvolatile acids, chiefly the acids of the acetone group, contribute to this acidity.

The latter are eliminated by the kidneys, when circulating in excess, but urinary acidity determinations, on account of many complicating factors, furnish no reliable index of acidosis.

As a rule, the blood-alkalinity is automatically regulated by fixed alkali of the tissues and, when these are exhausted, by ammonia, so that the H-ion concentration of the blood does not become materially altered. The reserve alkalinity of the blood, i. e., the ability of the blood to retain the normal reaction despite the addition of acid, is generally somewhat decreased. Such determinations, however, present great technical difficulties, rendering them impractical for routine estimations of blood-reaction and the establishment of the diagnosis of acidosis.

More reliable, more rapid and more simple is the determination of the carbon dioxide concentration in the alveolar air (Fridericia Method and Instrument, *Zeitschr. f. Klin. Med.*, 1914, LXXX, 1-12). Normally a partial pressure of from 38 to 45 mm. should be found. Low alveolar  $\text{CO}_2$  tension spells acidosis. The underlying principle can be briefly expressed as follows:

Non-volatile acids in the blood decrease the power of the blood to neutralize  $\text{CO}_2$  entering the blood from the tissues, thus increasing the blood acidity, stimulating respiration and producing an initial increase of alveolar  $\text{CO}_2$ -tension. The amount of cir-

culating  $\text{CO}_2$ , under these conditions, becomes decreased and, as the tension of  $\text{CO}_2$  in the alveolar air equals the  $\text{CO}_2$  concentration in the blood, partial pressure determinations of the alveolar  $\text{CO}_2$  constitute a means of determining the degree of acidosis.

The acids of the acetone group (beta-oxybutyric acid, diacetic acid) constitute the chief non-volatile acidifiers in diabetes. They appear mysteriously as a part phenomenon of all severe metabolic disturbances, whenever the fat reserves of the body are vigorously attacked. There has been much controversy in regard to their origin, but their derivation from fats is most plausible. They are chemically more closely allied to fat and the higher fatty acids than to proteid and its degradation products (although the passage of certain amino acids as leucin, tyrosin, phenylamin through the liver causes the appearance of some acetone in the portal blood) or to carbohydrates. There is no parallelism between the disintegration of body proteid (as indicated by the N-excretion) and the appearance of acetone bodies, whereas there is such a parallelism with fat destruction; a fat person (diabetic or not) undergoing inanition will invariably respond by an abundant excretion of acetone bodies, a lean individual under equal conditions not so copiously or in extreme cases not at all. In certain types of severe diabetes the acetone bodies excretion is occasionally so great that were all the C of the proteid that is lost converted into acetone bodies (manifestly impossible), even this amount would not suffice to form the amount of acetone bodies found; hence fat is the main source.

High grades of acetonuria in diabetes are often associated with lipemia (or better, lipoidemia). An ingenious theory (Reicher)

postulates that the acetone, like other narcotics, leaches the lipoids out of the cells and thus produces some of the narcosis phenomena of coma and precomatous stages. The withdrawal of abundant lipoid from the cells causes increased fat catabolism and thereby more formation of bodies of the acetone group, hence a vicious circle becomes closed, with acidosis, acetonuria and loss of fat reserves. The lipoidemia in these instances is due not to deficient fat destruction but rather to failure of the circulating fats to form the water soluble fat-albumen compound that is normally formed; and this may be due, as we know from collateral experiments, to the circulation of excess acids (chiefly lactic acid), so that the lipoidemia of diabetes may, in an indirect sense, also be interpreted as an acidosis phenomenon.

In a normal subject withdrawal of carbohydrate generally produces acetonuria; this disappears again upon the resumption of carbohydrate feeding. In the first instance it is probable that the fat reserves are attacked, in the second instance that the carbohydrate acts as a "fat saver" and prevents its disintegration. Similar conditions are found in diabetics, particularly in the fairly well nourished cases of mild diabetes. Here the addition of carbohydrate to the point of individual tolerance, or even slightly beyond, generally causes disappearance of acetone bodies from the urine and reduction of the acidosis. Other "fat savers," or as they are called antiketogenic bodies, are alcohol, lactic acid, citric acid, glycerine; and these can to advantage be employed in this type and grade of the disorder.

In the very severe types of diabetes, in which the glycosuria and ketonuria can only be caused to disappear by complete fasting (Naunyn, von Noorden, Guelpa and, more recently, Allen) the addition of fat to the

diet will promptly cause the reappearance of both the sugar and the acetone bodies. Here, as in the case of proteids and of carbohydrates, tolerance determinations for fat should be made and individual peculiarities of the patient established. "Fat sensitive" diabetics with a very low fat tolerance after fasting are not rare.

Prevention of acidosis in the milder grades of diabetes is not a difficult problem, provided routine proteid-fat feeding is not adopted without control. With an amount of carbohydrate administered within the limits of established tolerance, together with sufficient fixed alkali in the form of soda bicarbonate to protect the tissue alkalies, acidosis can usually be prevented or held within safe bounds indefinitely, while at the same time the patient's general nutrition and strength can be comfortably maintained.

In the more severe types of diabetes, viz.: that class in which carbohydrate tolerance, even for a single carbohydrate (oatmeal cures), is low or nil and in which some reduction of proteid must be practiced to cause a disappearance of the glycosuria one can adopt one of two plans, viz.: Either inaugurate a short starvation period, determine the tolerance of proteid and carbohydrate, permanently reduce the patient's weight, i. e., total caloric requirements, carefully establish the fat effect and then feed accordingly, with soda, thus keeping the patient undernourished but free from glycosuria and ketonuria; or, more practically, several recent writers of an academic bias to the contrary notwithstanding, permit a mild glycosuria within controlled bounds by giving proteid and carbohydrate slightly above the established tolerance limits, with little fat, abundant soda and alcohol, thus maintaining in a much more adequate and, to the patient, more satisfactory and equally

safe way nutrition, strength and enjoyment of life.

Personally I cannot from my experience subscribe to the newer dictum that every diabetic should be kept permanently sugar-free, if necessary to accomplish this, thin, and, in any event, undernourished. If one could keep these patients permanently or, at least, for months in an institution this plan might be of advantage, but, from the standpoint of the physician in actual practice and from the standpoint of the vast majority of patients, the full nutrition plan, with controlled glycosuria, is more feasible and, above all things, more human.

In the very severe types of diabetes, and to this group belong most of the childhood and adolescent types, one is usually confronted with a desperate and, as far as the end result is concerned, a hopeless situation. Here no sacrifice is too great and the principle of *rest* to the deeply disordered metabolic function must be carried out to its utmost limit. Strict individualization as to tolerance is required. A short cut to these studies is the starvation plan. Instead of consuming weeks to practice slow proteid starvation, one can apparently arrive at the same goal more quickly and apparently as safely and without the use of soda by a fasting period, preferably preceded by a short term of proteid starvation. Personally, I have learned to combine the starvation with the administration of pancreatinized oatmeal by rectum as an equally rapid and less weakening process.<sup>1</sup>

The effect of fasting on acidosis varies in these cases, the element of idiosyncrasy is pronounced and it is important to individualize. One can never predict in advance just what will occur, so that this form of treat-

<sup>1</sup> See forthcoming publication on "Supplementary Rectal Feeding in Severe Diabetes."

ment, to render it safe, should remain an institution method, carried out under the most accurate control and with all emergency measures at hand. I rather dread the effect of the coma mortality that the popularization of this precarious method will have, when administered as a routine. Most alarming degrees of acidosis do unquestionably appear and carbohydrate must occasionally be given to save life; if the patient survives, a second fasting attempt may be, and often is, more successful.

My experience so far has taught me that, even after taking the risk and imposing the sacrifice of a fasting course in very severe types of diabetes, the good immediate results, even in the most favorable cases, are not followed, after the patient is dismissed from personal observation and control, by end results materially better or more permanent than those obtained by the slower, but safer and less irksome process of slow proteid starvation.

The subject of acidosis remains obscure, paradoxical, bizarre, uncertain. Newer methods may stabilize our conceptions and clear our understanding. That an acid intoxication can produce air hunger, Kussmaul breathing, vomiting, convulsions, delirium, coma is established, but whether the fulminating picture of diabetic coma is always due to such an acidosis remains problematical. The metabolic derangement is so extreme, the degradation of the proteids and fats so abnormal that any one of numberless intermediary products of katabolism, the existence of which we may not even suspect, might be incriminated with causing coma; I have never been able to suppress the conviction that highly toxic products of proteid disintegration, still albuminoid in character, play a part; when we remember that the nearer the albuminoid degradation

products approximate the original molecule the more toxic they remain, when we recall the super-toxic properties of toxalbumins, ptomatoxins, and of all that group, one is strongly tempted to postulate that, even in minute quantities, they can produce the tragic picture of coma.

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## ACIDOSIS AS A POST-OPERATIVE COMPLICATION.

BY

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Delayed chloroform poisoning or post-operative acidosis has not yet received the amount of recognition that it deserves. It is the subject of spasmodic interest usually aroused by an uncomfortably sudden catastrophe after, it may be, a simple operation. By many it is considered a mere mirage.

As the years pass, one is constantly coming across hospital residents or internes who have no knowledge and who may never even have heard of the condition. This unfortunate state of affairs may be accounted for by the way in which anesthetists are liable to be shut out from the post-operative progress of the patient.

Again little attention is given in the much crowded text-books to this interesting but obscure subject.

The broad light of observation, once the condition has been recognized shows as might be expected that there is great variety in the severity of the cases. At the one extreme is the slightly prolonged post-anesthetic vomiting. At the other is the catastrophe terminating in death. In the latter should the disease be sufficiently long drawn

out the final stage is that of acute yellow atrophy of the liver. I have myself had experience of one such case. A woman 27 years of age was admitted to hospital with a history of repeated hematemesis. A gastro-enterostomy was performed. The patient gradually went down hill and the terminal stages were identical with those of acute yellow atrophy. The post-mortem findings also corresponded. I am unable to say anything about the possibility of an acidosis condition having preceded the operation.

**Causation.**—In all cases there is a predisposing factor of which we have little or no knowledge, but which is intimately bound up with the functions of the liver, and the metabolism of fats and carbohydrates. The anesthetic is to be considered as the detonator. The influence of the nervous system cannot be excluded. Stimulation of nerves is capable of causing excretion of the indicators, acetone and diacetic acid, in the urine. The poor anesthetist and his drug are apt to be blamed for a sudden death when they are blameless.

Acidosis apart from anesthetics is by no means uncommon. The importance of realizing this lies in the influence it may have in the prevention or at least the mitigation of the condition where operation is imperative. It is to be suspected where an exhausting illness has been present, and usually it implies starvation in metabolism if not in the actual intake of food.

Acidosis may be found in the following conditions:

- (a) Starvation.
- (b) Cyclical vomiting.
- (c) Vomiting of pregnancy.
- (d) Sepsis (abdominal).
- (e) Rickets.
- (f) Diabetes.

From the surgical standpoint sepsis is the

most important of these, and this is especially so in abdominal cases.

Of the anesthetics in common use chloroform has received most blame, but in spite of all it still has a very large following on account of its compactness and ease of administration. It is true that chloroform exerts an influence on the excretion of diacetic acid and acetone, which is more powerful than that of say ether. Ethyl chloride is probably as bad as chloroform but it is given for short periods and is not so likely to be followed by an acidosis.

Gas and oxygen is about the best anesthetic from this point of view, but suffers by comparison from its bulk and expense. Open ether is on the whole a happy compromise from the points of bulk, expense and immunity.

**Sex.**—With regard to sex there is little to note. Women are perhaps more liable to suffer than men.

**Age.**—Children are much more liable to suffer than adults. By far the greater proportion of the cases I have seen has been in children.

**Clinical.**—There are of course many minor cases which escape notice unless careful watch is kept. All that may be noted in the report is that vomiting lasted longer than usual.

*In Severe Cases.*—During the course of the operation it may be noticed that the patient goes under with surprising ease, the breathing is very shallow and requires careful watching; with a good air entry there is a tinge of cyanosis in the cheeks, ears, and mucous membranes.

Afterwards the effects of the anesthetic take a long time to pass off, indeed consciousness may not be regained. If conscious the child becomes very restless and tosses about, cyanosis becomes definite,

vomiting is frequent, of small quantity and coffee ground in character. The reason of this is found post-mortem. The pulse rate rises rapidly and diminishes as rapidly in volume. The temperature shoots up, even in a clean case and if in an abdominal, visions of sepsis appear, and much searching of heart. Temperatures of 103° F. to 105° F. may be expected. The patient soon becomes unconscious. In a child shrill cries may be heard. In the adult maniacal delirium requiring strong restraint to prevent the patient getting out of bed is a feature. Coma rapidly supervenes, terminating in death in a matter of thirty-six hours. If the urine be examined strong reactions to acetone and diacetic acid are found. But if the case is more prolonged, these as the case passes into the condition of acute yellow atrophy, may be absent and leucin and tyrosin found in their place. The breath has a peculiar sweet sickly odor.

The tests usually employed are as follows: *Acetone*. Shake a small crystal of sodium nitroprusside in a test tube a quarter full of urine. Then pour strong ammonia in gently to form a layer of ammonia. The following will be noted. If the urine froths a deep magenta color appears in the froth and a ring of the same color at the junction of the two fluids.

*Diacetic Acid*.—Add ferric chloride by drops to the urine. If necessary filter off the precipitated phosphates. Then add more ferric chloride. A port wine color indicates the presence of the acid.

**Pathology**.—The liver and the stomach present the most evident changes.

In the former the changes vary with the duration of the case.

In the acute cases the liver is of about the normal size. The color is pale light yellow. On section the surface is soft and

friable. There is a striking absence of blood in the veins.

On microscopic examination a well marked fatty infiltration is found with loss of the usual staining properties.

In the latter multiple small hemorrhages are found in the mucous membrane. This accounts for the "coffee ground vomit."

The condition of acidosis can be produced experimentally in animals by the injection of acids into the blood stream.

The injection of acetone and diacetic acid does not produce the signs and symptoms, so it is believed that the causative bodies are those occurring higher in the scale of the decomposition of fats.

It is not necessary that an acid reaction takes place in the blood; long before the neutralization point of the plasma sufficient alteration occurs to produce profound changes in metabolism. It is a diminished alkalinity.

So far as is known this alteration reacts on the liver. If the body successfully combats this, restoration of the balance takes place with recovery of the patient.

Apparently imperfect oxidation of fats occurs and fatty acids circulate instead of carbon dioxide and water. At first the store of alkalies in the body is used up. Then failing them the ammonium radicle is called up. It is at this stage that the symptoms of poisoning appear.

The carbohydrates act as preventive bodies. They contain a large proportion of oxygen in the molecule in contrast to the small amount found in fats. Part of this oxygen is given up and assists in the decomposition of fats into simpler and less poisonous products.

It is a condition of starvation. The body needs food, the first call is on carbohydrates.

These rapidly fail, then come the fats and proteids.

**Treatment.**—Prevention is the best means of treatment. This may take the form of (a) previous treatment, (b) choice of anesthetic.

**Previous Treatment.**—Avoidance of starvation, especially in children. Infants should be fed as usual up to the time of operation. In young children light food should be given up to two hours before operation. It is necessary to insist upon light easily digested food, because of the well known influence of excitement upon digestion.

Routine examination of the urine for acetone and diacetic acid.

Two to four ounces of glucose as a readily absorbed form of carbohydrate should be given during the twelve hours before the operation. It may be taken as a syrup, or if the sweet taste is distasteful diluted in water and flavored with lemon juice.

Chloroform is known to have a marked effect. Its use should be avoided, especially in children where there is sepsis or a preceding condition which has interfered with the intake of carbohydrates. Ether by the open method is the best anesthetic for everyday use.

Alkalies are excreted as rapidly as they are taken and so are of no value.

In a case of acidosis every attempt should be made to get the patient to take glucose, which can be given without limit. I have known a child to sup it out of the pot. Of course if the liver is too much damaged to use the glucose no benefit can be expected. If the vomiting is frequent glucose can be given per rectum or even intravenously. Intravenous injection of alkalies i. e., sod. bicarbonate can be tried. The best and most hopeful treatment is by the use of glucose.

## THE DERMATOSES OF ACIDOSIS.

BY

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The prevailing idea of acid intoxication was dimly prefigured in the hazy perceptions of our medical forebears. Running through their ill-defined and sometimes grotesque etiological concepts was the leaven of true intuition. They attributed much to acid *saturation*. Their therapy is proof of this. Their phlebotomy, purgation, diaphoresis and heroic dietetics were all devoted to ridding the blood of irritating constituents tending to the production of many maladies. Alkalies appear prominently in their massive ministrations. They did not thoroughly understand the significance of the problems they were attacking nor the wherefore of the remedies, but it is remarkable that the instinctive validity of many of their procedures is receiving today the corroboration of the acutest scientific research. We are discovering, much to our surprise, that in medicine as in other fields of mental endeavor there is nothing new under the sun. That is not to say that no new facts are discovered, which would of course be a rank absurdity; but that in our search for the causes of things we are continually encountering conditions that show that our conclusions had been anticipated. This is disconcerting to our proud contempt for the crude devices of premodern medicine. We are richer in the machinery of investigation; in the so-called arms of precision that enable us to demonstrate so much that was suspected; the lens, the X-ray, the sphygmograph, and the tube of the serologist; but it is a question whether we are richer in the mental equipment that empowers a man to reason

out the causes and relations of multifarious phenomena coming under his observation. It is not surprising therefore that by sheer force of intellect much was deduced that after the usual period of skepticism and ridicule has been proven absolutely sound.

Haig in his apotheosis of uric acid gave clearer utterance to the thoughts of his predecessors than they had been able to do themselves. He crystallized their vague surmises into a definite doctrinal deliverance. With better means of determining metabolic disturbances, he could support his hypothesis by numerous confirmatory instances. He made a good case for acidosis. But unfortunately he missed the full significance of the phenomena he was tracing, and contracted his pathology into "uricacidosis." Doing this he fell short of the tremendous reach and scope of the problem in hand. Uric acid was an irritant in some way obnoxious to the cells and fluids of the body. By exciting various reactions and entering into various chemical combinations it brought forth in some dimly visualized manner, definite pathological entities such as rheumatism and gout, and a whole host of correlative and dependent conditions. It soon assumed the dazzling eminence of a *prima morbi causa*. It might without the suspicion of levity be described as a sort of pathological Pooh Bah, holding etiological office to most of the ills distressing humanity. There might be a few diseases such as syphilis and tuberculosis not yet included in the range of its fecundity but further investigation might bring startling illumination even in this regard. And if no direct causative connection can be shown it is asserted that the presence of uric acid in the blood aggravates the malignity of these alien marauders. It is even urged today with a brave array of clinical corroboratives that

cancer is attributable to this well nigh omnipotent factor. So fast is its hold upon the popular imagination that every deviation from the normal is ascribed to its illimitable influence. Has a patient lumbago—uric acid. Has he migraine—uric acid. Has he renal colic—uric acid. Has he eczema—uric acid. Has he asthma—uric acid. The manner in which it produces all these diverse clinical pictures, is not made perfectly clear. Indeed so much is left to the imagination that it may be fairly stated that the action is talismanic. Racing through the circulation of a certain individual, it lights upon a tissue of peculiar susceptibility and lo! we have trigeminal neuralgia! Enticed to the toe of a hearty feeder it flares up into rich man's gout. Enticed to the toe of an underfed vagrant it flares up into poor man's gout! Snared in the pelvis of a certain kidney it forms the nucleus of an urinary calculus. Coursing through another sort of kidney it brings on a sclerosis of its functioning elements and we have chronic interstitial nephritis. Precipitated by some unknown influence into the greater joints it brings out the picture of acute articular rheumatism (as *distinct* from gout) with its pernicious effect upon the endocardium. This pronounced diversity of pathogenic activity is unparalleled. It transcends anything observed in other morbific agents. The tubercle bacillus has a well defined range of influence. This may be wide but it is nevertheless limited. The spirocheta pallida, despite the reputation enjoyed by syphilis, as the great pathological mimic, produces certain well recognized lesions which vary in their manifestations only because of their varied situations. But uric acid is invested with a mysterious power of creating diseases of utterly dissimilar characteristics. The therapy of uricacidosis seemed to confirm the claims

of its sponsor because it happened to be in the main the therapy of the greater "acidosis." Haig deserves unstinted approbation for focusing attention upon the problem even in the imperfect form which it assumed under his manipulation. The idea of acid intoxication was there although its full significance was lost in the narrowing of its activities to those of uric acid. Had he not been seduced to the pursuit of this one chemical irritant, his reasoning might have led him to the realization that *any* acid may exert upon the cells a tremendous power for evil, if it chance to be in excess of the resources of immediate neutralization. That power consists in the augmentation of the absorptive capacity of the cell, so that it attracts to itself such fluids as may be within its suction range, and swelling to a greater or less degree, is proportionately inhibited in its peculiar function. That is the thesis of acidosis. It is a very much different proposition from that of the vague occultism of uric acid. Here is a definite presentation of a biological fact. The colloid tissue of which we are constructed maintains a nicely adjusted balance in its absorptive and secretive processes, so that it is at the highest point of functional efficiency. If this balance is disturbed and the tissue is overcharged with water, it becomes loggy, lethargic, and incapable. The presence of *any* acid will cause the colloids to swell; the uric acid of Haig if you will; the acid products of proteid metabolism; the acid products of excessive muscular effort; the acid consequences of insufficient nutriment; the carbonic acid accumulating in tissues incompletely oxygenated.

The occurrence of edema in nephritis has always been a puzzling phenomenon, and the explanations ordinarily offered have been self-contradictory and unsatisfactory. In-

creased permeability of the blood vessel walls and increased blood pressure to drive the water through were the factors relied upon to explain the condition. But strange to say, the most pronounced edema occurs in conditions of lowest pressure and little or no edema occurs in conditions of high pressure. In chronic parenchymatous nephritis there is early and marked edema, and the blood pressure is low. In chronic interstitial nephritis, there is practically no edema until the high pressure begins to fall in consequence of cardiac dilatation. In chronic endocarditis with compensation complete, no edema appears although the pressure is high. When compensation begins to fall, edema appears at the points most affected by the pull of gravity. There is no explanation here adequate to the purpose. Something more coherent will have to be adduced to reconcile the incongruity. Colloid chemistry comes to the rescue and readily accounts for the clinical manifestations. In the case of the kidney, irritation of its parenchyma by the circulation or development therein of an unneutralized acid causes it to swell by the absorption of water. This obstructs its function and there is a reduction in the excretion of urine. At the same time the presence in the other body tissues of the same acid, brings about the identical result: there, and they become boggy with the fluid they have absorbed. Surface edema is accompanied by that of the deeper tissues as the circulation of the poison is universal, and we have anorexia and vomiting from involvement of the stomach, and hebetude, headache, coma and convulsions from involvement of the brain. The "wet brain" of our ancestors is a term whose perfect accuracy has been thus triumphantly vindicated. The poisons capable of inducing this destructive acidosis, are probably many and

various. Persistent metabolic derangements throwing augmenting stress upon the tissues fighting to maintain an equilibrium develop toxins that eventually get the upper hand. The constant ingestion of alcohol in large quantities diminishes the supply of oxygen to the tissues and thus favors the development of acids therein. Anesthetics such as ether and chloroform furnish familiar examples of this curtailment of oxygen, in the cyanosis so prevalent during their administration. Carbonic acid accumulates and the prerequisite for the superhydration of the colloids exists. If this is not completely overcome we witness the symptoms of urinary suppression and acute nephritis. Other poisons such as morphia, cocaine and belladonna, diminishing the supply of oxygen to the tissues, accomplish the same results in proportion to their dose and potency. The various bacteria that gain access to the circulation and elaborate the different clinical syndromes known under the titles of pneumonia, typhoid fever, diphtheria et al., operate in the same way, and the lethal indications are largely those of intense acidosis. Your pneumonia patient dies much more frequently from acidosis than he does from so-called cardiac failure. A distended abdomen is the most alarming symptom obtruded upon our horrified observation in the course of this treacherous obsession. In the case of rheumatism the underlying acidosis is generally acknowledged. It is a matter of universal agreement that the excretions of the rheumatic are decidedly acid; urine, saliva and perspiration turn litmus red. Of old an acid etiology has been maintained for this distressing and dangerous derangement. The birth of a new bacillus does not weaken this contention because the consequence of all bacterial invasions is the production of an acidosis. So whether the ex-

citing cause of rheumatism is a germ like the bacillus *rheumaticus* or any one or any number of germs hatched out in the fetid incubator of the sluggish gut or a humeral distillate of abnormal metabolism; the great practical fact remains that the clinical product is an acidosis of a most tenacious type.

The presence of fluid in the rheumatic joint is due to the process of "syneresis." This means the absorption of water by a colloid body and the subsequent solution of part of the absorbent in the re-exuded fluid. This accounts for the effusion in pleurisy and for the albumen in nephritis. It also accounts for some of the cutaneous eruptions with which we shall be presently concerned and for that reason has been properly accorded a few words of explanation. Everything hitherto developed has had that object in view for it would be difficult to show the cutaneous ravages of acidosis without a preliminary review of its general pathological character. The conception of the absorption of water by a colloid body explains the wonder of the urticarial wheal. The conception of "syneresis" explains the water in the blister. It has been our wont to ascribe certain skin diseases to rheumatism. The association seemed significantly frequent, and the etiological dependence was plausible. In view of our fuller knowledge it will be necessary to rearrange our data and describe rheumatism and its *ci-devant* dermatoses as concomitant consequences of the general acidosis. If a patient with acute articular rheumatism develops a purpura we recognize that the acidosis has found expression in both these dissimilar outbreaks. Purpura does not occur because of the rheumatism but because of the condition that has produced the rheumatism. From the standpoint of colloid chemistry it would appear at first glance almost hopeless to account for the

passage of the corpuscles through the walls of the blood vessels. But a little reason aided by a little experimentation, will furnish a satisfactory explanation. Both the blood vessels and the blood are colloid bodies. A denser colloid will pass through a softer one. A colloid distended with water will let through a colloid not so distended. Drops of quicksilver will not penetrate a disk of gelatine immersed in water. But they will penetrate the same disk immersed in *acidulated* water. Blood vessel walls of normal consistency will resist the passage of the corpuscles. But if the walls are edematous from the absorption of water under the influence of an acid irritant they will allow the denser corpuscles to escape. The conditions for this are present in so-called rheumatism. It is far from obvious why the acid weakens only certain vessels just as it is far from obvious why it assails only certain joints. Of the rationale of its action however there can be no dispute. It is sustained by the teachings of colloid chemistry and the experiments made *in vitro*. Purpura is easy of recognition. It is rarely overlooked at least for any considerable period. Punctate lesions may be misinterpreted but those of larger size especially the irregular splotches, will rarely cause confusion. They are inexpressible. They are bright red or purplish. They are gradually absorbed going through the various discolorations seen after a contusion.

Consanguineously related to the foregoing is erythema multiforme. This remarkable dermatosis is variously ascribed to intestinal putrefaction, to irritating ingesta, and to rheumatism. These distinctions are of little moment. Any or all of the factors may be operative in inducing the acidosis that is the determining cause of the outbreak. The characteristic and significant ele-

ment in the makeup of the lesions is "edema" papules varying in size from that of a pinhead to that of a large coin elevated, flat and centrally depressed are the typical manifestations. These have been quite aptly compared to little targets, with dotted bulls eyes. Sometimes a central papule will be surrounded by a ring of papules or by two rings whereof the color fading in the order of their appearance, leaves a variegated plaque, fancifully likened to a rainbow. Hence the designation "erythema iris." Adjoining plaques may coalesce, making fantastic gyrate figures of a quite extensive compass. The onward sweep of the initial invasion may be a long lash like curve enclosing many inches of skin. Enormous circles may be formed and circles in any variety of fracture and intersection. Flares of erythema may be interspersed with small and large nodosities. In the intenser varieties vesication is produced. The vesicles may be small and arranged in concentric circles around a central one, achieving the same design as in erythema iris; but here denominated "herpes iris." There is apparently no limit to the number or size of the blisters observable in this curious dermatosis. A single blister has swarmed over an entire ear. Another has monopolized an entire upper eyelid. Startling resemblances to other objects have been noted, for example, a string of bullae has been seen to encircle the neck in close imitation of a chaplet of pearls. Many other peculiar devices have been wrought by the whimsical disposition of these varied lesions. Aptly indeed has the disease been termed "erythema multiforme." It has been remarked in passing that the characteristic element in the makeup of the lesion is "edema." And we have seen that the cause of edema is the swelling of colloid tissues under the influence of an acid.

The very structure of the lesions therefore establishes the etiology. The papules are illustrations of the hydration of colloid tissue. The bullae are illustrations of the more advanced process of "syneresis" wherein the fluid absorbed is subsequently given off as a solution of its container. The therapy employed is strongly corroborative of the correctness of this opinion. Sweeping the bowels clean; lowering the diet to the vanishing point; and the administration of alkalies meet the indications perfectly. Contenders for the specifically rheumatic causation of erythema multiforme point to the happy effects of the salicylates as proof of their diagnostic shrewdness. As the salicylates are generally prescribed in connection with rhubarb and soda and a marked alteration in the quality of the ingesta, the credit for the result is dimmed by distribution. Haig maintains that the best solvent of uric acid is salicylic acid. In so far as uric acid may be concerned in the development of erythema multiforme, we may concede the therapeutic value of the solvent. But it is pretty well understood that uric acid is simply the titular aggregation of the various processes resulting in acidosis; a sort of personification of acidosis. From this viewpoint the salicylates can have no specific action in overcoming the effects of acidosis. This is exemplified in the unsatisfactory results of the administration of the salicylates in rheumatism, unless the diet is carefully attended to. The pain will abate, but will promptly return on suspension of the remedy unless the elements making for acid metabolism are eliminated. A further argument for the rheumatic etiology of erythema multiforme is offered in the arthritic pains frequently associated with it. Maintaining that both conditions are the outcome of the same systemic vitiation it is not difficult for

us to account for their simultaneous appearance.

Urticaria popularly known as the hives and nettle rash, is closely allied in the layman's mind with the eating of indigestible or irritating articles of food. Certain people have a pronounced idiosyncrasy to certain fare, for instance, oatmeal, strawberries, tomatoes, bananas, pork, veal, etc. The urticarial wheal is circumscribed edema rapidly responding to intense irritation. The white turgescence is ocular evidence of this. In the vesicular forms the demonstration is complete because we have the fluid formed by the process of syneresis. According to our hypothesis this edema is due to acidosis. Corroboration of this is found in the sting of bees which produces a sudden localized edema admittedly of acid origin. The prick of the nettle which has furnished urticaria with one of its familiar synonyms, and also with its scientific designation, injects an acrid poison into the skin multiplying the hydration capacity of the invaded colloids. Cumulative evidence of the common paternity of these two afflictions is found in the indistinguishability of the borderline cases. If either is due to acidosis both are due to acidosis. And there is no shadow of a doubt regarding urticaria.

Angioneurotic edema by its very title comes into the same category. The monster mobile tumefactions bursting forth without premonition and subsiding after a brief annoyance only to change the field of operations, illustrate perfectly the swelling of colloids under acid stimulation, and their recession upon its withdrawal or neutralization. This may be fairly classified as an exaggerated form of urticaria, responsive to the same influences provocative and therapeutic.

Under the appellation of Schonlein's dis-

ease have been comprehended all four of the eruptions which we have just described. Purpura, erythema multiforme, urticaria, and angioneurotic edema, will be found indiscriminately and simultaneously scattered over the extremities generally in the neighborhood of a swollen joint. The erythema is apt to be of the bullous variety and some of the bullae may be hemorrhagic. Nothing could more decisively prove the identity of the exciting cause in all these manifestations. If any reliance is to be placed upon intelligent observation then the rheumatic joint and all the accompanying dermatoses are part and parcel of the one systemic condition. The treatment confirms this opinion. Alkalies, milk, vegetables, and fruit with brisk catharsis indicate the plan of attack. The fruit and vegetable acids are combined with the salts that most vigorously resist the tendency to acidosis and the acids themselves are quickly oxidized into carbonic acid.

Erythema nodosum is the term applied to the outcropping upon the tibiae of pinkish painful prominences, varying in size from a pea to a large nut. They appear abruptly and disappear gradually, going through the color scheme of a contusion. They have been attributed to rheumatism and have been handled in accordance with that conception. As this meant alkalies and a meatless diet, the underlying acidosis was successfully combatted and the nodes gave up their excess water. The recognition of this peculiar pathological picture is usually not difficult. The absence of itching distinguishes it from urticaria. The presence of pain, the bright red color, and the location on the anterior surface of the shins distinguish it from erythema induratum, a tubercular infiltration favoring the calf of the leg. If the lesions are very numerous

and thickly huddled together the coalescence of the red areas may excite a suspicion of erysipelas. The involvement of both legs, the vividness of the hue, and the lack of constitutional symptoms will serve to mark the difference. Postulating rheumatism we postulate acidosis and add another striking touch to the kaleidoscopic picture. It is rather generally conceded that friable nails are indicative of the rheumatic proclivity. They are taken to mean abnormal metabolism resulting in a faulty structure. Here is no question of edema because the tissue is too dense and hard to permit absorption. But here is a decided hint as to abnormal possibilities elsewhere, and it is well to recognize its full significance.

Sudamina are observed in conditions of excessive perspiration especially perspiration from the elimination of some pathological product. Such a product is acid. It causes distention of the minute globules with water picturing in miniature the process of syneresis observed in erythema bullosum. These sudamina often persist as a punctate dermatitis gradually evolving into a punctate eczema. Eczema having begun in one form may assume any other in its plethoric repertoire. Its versatility and variability are proverbial. The broaching of eczema in this relation recalls the keeness of the old-fashioned etiology. Eczema was regarded as a humor in the blood to be met by a rigidly curtailed dietary and the generous administration of alkalies, cathartic and diuretic. We meet it in that identical fashion today if we are alert for our patient's lasting benefit. Any man who has cast a critical eye upon the dermatitis, familiarly known as eczema, realizes the futility of purely local treatment. To be sure there are trivial transient attacks due to well recognized and removable influences which

will yield promptly on the application of salves and lotions supplemented by the protection of the parts from further irritation. But the more generalized manifestations, apparently independent of any local provocation, will not yield to such simple measures. It is evident that some internal cause is maintaining the cutaneous reaction, and local treatment alone is highly unsatisfactory. Another consideration of much significance is that some individuals react unfavorably to irritations that are harmless to others. This indicates a lessened power of resistance or an additional element of irritation operating from within. You may phrase it as you please but the fact remains that a patient thus constituted, develops eczema with the greatest readiness, even without external excitation. If it be contended that there must always be an exciting cause, then we are forced to admit that that cause may be circulating in the blood. If it be contended that there is a constitutional predisposition easily responding to trivial trauma, we may not flatly deny the probability, because we are aware that altering the patient's manner of living frequently strengthens his power of resistance. But as a rose by any other name would smell as sweet, and there is no practical advantage in seeking a cleavage between tweedle-dum and tweedle-dee, it is a matter of the utmost indifference which attitude is assumed if the necessity of meeting that internal condition is clearly recognized. Experience has taught us that the moderating of table indulgences, the generous employment of saline cathartics and the free administration of alkaline diuretics (the so-called cooling process of our underrated predecessors) have a decided controlling effect upon the tendency to eczema. This can be readily explained on the hypothesis of

acidosis. A strong protein diet reinforced by malt or spirituous liquors, the intestinal disturbance consequent upon the inordinate ingestion of sweets, defective excretion due to inactivity; all tend to the production of acid in the blood and tissues in excess of the possibility of prompt neutralization; and the colloids of which we are so largely made up, especially in our functioning elements, swell by the absorption of water from their immediate neighborhood; and we note scanty urine, yellow conjunctiva, constipation, dull throbbing headache and very often—eczema. It is asserted in all the classical descriptions of eczema that it is a catarrh of the skin. There is an inflammatory process with an exudation of serum. This exudation follows a previous vesiculation which is always demonstrable in eczema even in the so-called erythematous variety in which it is so fine as to escape the scrutiny of the unaided eye. The vesiculation as we have already seen means syneresis, an advanced phase of colloid hydration. The exudate from the eczematous patch stiffens linen. It is of the nature of glue—in other words colloidal. With theory breezing along so evenly and clinical occurrences lending palpable support and confirmation, and treatment rounding out a picture of perfect symmetry, we are not presumptuous in claiming the solution of the vexed question of eczema. It demands some degree of temerity to assume such a position, in the face of the reams of rhetoric expended in befogging the issue. We shall be accused of adding just another item of confusion. But an unprejudiced examination of the evidence will bring the conviction that we are offering an exposition that is coherent, rational and adequate. It accounts for the occurrence of eczema in those able to avoid external irritants. It accounts for the

persistence of eczema in those relieved from habitual external irritations. It accounts for the susceptibility of one patient and the immunity of another. It sets the diet and medication on a scientific basis and rids us of the reproach of shooting blindly in the hope of an accidental hit in the dark. We can defend our therapeutics as an intelligent adaptation of means to a perfectly comprehended end.

Intertrigo despite its exceedingly commonplace qualities offers much food for reflection to the investigating mind. In the first place it is extremely annoying not to say torturing. Its obstinacy aggravates this feature necessarily. Its triviality in the eyes of the unafflicted adds an element of exasperation. It is anguish enough to endure such a visitation without the aspersion of malingering or exaggerating. The pain is caused by the denudation of the epithelium and the exposure of the terminal nerve filaments to the action of an acid perspiration. This denudation is attributed usually to the friction of two opposing cutaneous surfaces. But this clearly fails to account for it since opposing cutaneous surfaces exist in everybody and intertrigo does not. Something is needed to show what determines the discrimination. Moisture, heat and friction are to be found in every axilla, groin, gluteal sulcus, and mammary fold. Yet intertrigo is not universal. What is it that incites one skin to unfavorable reaction while others escape? Unquestionably some attribute inherent in the individual, or casually associated therewith. Of the latter sort might be mentioned rough woolen clothing, fitting tightly about the axilla or thighs; coarse stiff napkins and diapers; injudicious vigor in the use of harsh bath towels; the employment of caustic soaps and their incomplete

removal; the application of stimulating ointments for the relief of pruritus.

But there are many other cases where it is impossible to hit upon any extraneous irritant and we are forced to admit that the fault lies in the individual, and reveals itself under circumstances of ordinary physiological activity. It is noted that the victims of this disabling dermatosis are of the mammoth sort running to extremes in bulging contours. They display all the earmarks of overfeeding, overdrinking and inactivity. Rolls of fat grotesquely accentuate the natural outlines and suggest a generous larding of the interior. The excesses that have wrought such alterations in the native grace of woman must necessarily have accomplished it through the glutinous indulgences that result in acidosis. And here we find the key to the problem. It is the systemic vitiation that alters the resistance of the skin and supplies the irritant that destroys the epithelium. A pronounced acid perspiration is detectable in all these cases, indicative of the perverted metabolism, and provocative of the local reaction. It is notorious that intertrigo is rebellious in the extreme. The treatment is sorely disappointing; for the reason that we attack the local condition and ignore the constitutional. Along this line we never get anywhere. If we do not vigorously assail the causes making for acidosis, we may as well spare ourselves the fruitless task of regional medication.

It has been objected that babies are often the victims of intertrigo and surely they can not be charged with the gastronomic sins of their elders. Here we are treading on thin ice. The babies who suffer from intertrigo are the Lilliputian counterpart of the adults thus affected. They are prone to flabby obesity. And while they do not eat

too much, for the reason that they do not eat at all, they certainly drink too much of the wrong compounds. Abnormal metabolism is recognized as the common cause of their chronic derangements. This is due to faulty feeding. Acidosis is the inevitable consequence. The baby has a sour odor. Wet diapers macerate a skin prepared for feeble resistance. Here we have a logical sequence of events rounded out by the results of a rational therapy. It is reasonably certain that the breast-fed baby of a sanely nourished mother does not get intertrigo, even if he wallows in wet diapers. His urine is not acrid and his skin is not unduly sensitive.

Despite the contempt with which it is viewed in certain quarters, there is no question that the vegetarian treatment of psoriasis is sometimes wonderfully successful. One swallow does not make a summer. One case unsuccessfully treated does not discredit the method. In all conditions depending on dietary restrictions, there is always the suspicion that the patient is deceiving the doctor. Unless his compliance can be guaranteed by the surveillance of an attendant the weakness of our common clay will incline him to cowardly assuagements of his appetites. These he will blandly deny and the treatment is discredited without a proper determination of its adequacy. Where cases have been fairly tested in hospitals and under other conditions assuring unswerving fidelity the results have been encouraging and oftentimes complete. This would make for the acid pathology of psoriasis. While there is no actual scientific proof of this, there is a strong and dependable working probability. And frequently indeed we are forced to found our therapeutics on less secure ground than that. If the physician has the assurance

to whip his patient into the requisite degree of confidence and determination and the patient will be true to himself and his adviser, splendid and otherwise unattainable consequences may be expected. Half measures are doomed in advance. The absolute exclusion of animal foods (and soups made therefrom) of tea, coffee, and alcohol is demanded. Submission is onerous but fruitful.

Prurigo is a chronic exudative disease of the skin closely related to urticaria at least in the beginning and in full maturity characterized by small pale or reddish papules, favoring the extensor surfaces, and arousing the most intense pruritus. Histologically it is marked by edema; proliferation and swelling of the rete cells, infiltration and edema of the papillae and dilated lymph spaces. By repetition we shall learn that edema spells acidosis. There is an unneutralized acid in the tissues compelling the turgescence of the colloids. What this acid is in such a disease as prurigo is still beyond our knowledge. Probably it is due to some nutritional vice, just as is the acid of urticaria. The treatment in most of the books is almost valueless. It runs its obstinate course practically uninfluenced by the remedies prescribed. It relapses regularly after its spontaneous remissions. Being regarded as some sort of a mysterious nervous disturbance it is handled in a listless, hopeless, routine manner. Until its real pathology is recognized nothing else may be expected.

Dermatitis herpetiformis is another illustration of the utter futility of haphazard blows at a disease of which the cause is unknown. It is obstinately chronic, and exceedingly itchy. Its typical appearance is in the form of vesicles with a tendency to grouping and the leaving of pigmented

spots or scars. Expert dermatologists have been heard to doubt the diagnosis of dermatitis herpetiformis, because the eruption under inspection was recent and initial. Yet it is obvious that it cannot relapse unless it has made a first appearance. But its first appearance must be misconstrued if it cannot be recognized. This is a charming confession to make regarding a disease of such importance. It is thoroughly in keeping however with our ignorance of its etiology. It is gravely attributed to some disturbance of the nervous system. This vague evasion of a troublesome responsibility, and its convenient transfer to the reputedly omnipotent nervous system, may pacify the superficial thinker but if we pause to consider that the nervous system cannot originate disease; that it is acted on only by stimuli from without, both helpful and injurious; that its own deterioration and the consequences found in other tissues, are invariably the effect of extraneous influences we shall clearly perceive the puerility of the contention that it is accountable for dermatitis herpetiformis, or any other disease of the skin. We have got to get back of the wires and see what is originating the current. The histological findings in this disease are dilatation of the blood vessels, perivascular cell infiltration and edema with infiltration of the lymph spaces. Edema, always edema! And the cause of edema always acidosis!

Enough has been said I think to fix the conviction that in every dermatosis accompanied by palpable or histological edema acidosis is responsible. The reaction to trauma, to burns, to poison ivy is the same process exactly as the urticarial reaction to the irritant circulating in the blood. Both are due to acidosis. And both are identical with the cloudy swelling of nephritis,

and the dropsy following failing compensation. Edema of the lungs, edema glottidis, ascites, hydrothorax, glaucoma, are simply illustrations on a grander and more dangerous scale, of the colloid saturation observable in erythema multiforme. Until we can ascertain the individual agent inciting to acidosis in the different dermatoses presented for our consideration, we can only proceed upon the method adopted in graver emergencies, namely the curtailment of the offending ingesta and the administration of alkalies and neutral salts.

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## ACIDOSIS FROM THE GASTRO-ENTEROLOGIST'S VIEWPOINT.

BY

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Considerable attention is being directed towards a condition which we call acidosis. This term in the light of modern medicine is so broad and vague that it ranks with the older terms of rheumatism, fevers, and malarial fevers. Strictly speaking it is not a clinical entity but a condition accompanying disease. Further study will elucidate its etiology and mechanism of production and simplify its recognition and treatment.

It is believed that a great proportion of the youth and adult population have at all times more or less acidosis. Probably forms of rheumatism, gout, diabetes, arthritis, myalgias, neuritis, tinnitus, children's growing pains, migraine, headaches, neurasthenia, hysteria, forgetfulness, irritability, perhaps forms of epilepsy, disturbances of vision, hearing, mind, respiration, sleep, heart, stomach, intestines, dis-

turbances of metabolism including anorexia, constipation, diarrhea, urticarial manifestations, eczemas, indefinite abdominal pains, kidney lesions, cystitis, secondary anemias, persistent and progressive loss of weight, and a number of other diseases and so-called functional conditions, the severity of which, if not in their entirety, are dependent more or less upon the degree of acidosis present.

Many organs have been placed in the body whose chief function is a secretory one, yet nature in her wisdom providing for the sins and excesses of civilization, endowed many of these secreting organs with additional property—that of excretion—when necessary. The most prominent secretory organs are the liver, stomach, small intestines, pancreas, and salivary glands; the excreting ones being the skin, lungs, kidneys, liver and large intestines.

In the ordinary routine of life when care is observed and the physiological functions are not abused, these organs are sufficient for their respective purposes. A high degree of reserve function exists in these organs which can be called upon in times of necessity. Nature in her wisdom has purposely so constructed them, knowing well the weakness we possess. Exceeding physiological requirements relative to labor, sports, lack of rest, foods and adding thereto the excessive nervous strain and excitement incident to business competition, greed and unfortunate occurrences, the physiological equilibrium is overbalanced. Measures must be invoked to take care of this abnormal state. This is done by the reserve functions of the organs above referred to and when necessity demands it, the secreting organs as the liver, pancreas, salivary glands, small intestines and stomach are made to act or rather bring

into activity their excretory function, succoring the already overworked organs of excretion and help rid the system of the toxic material.

As regards the effect of acidosis on the gastro-intestinal system it is noted in general symptoms that are tabulated first. Most good livers have complaints which manifest themselves symptomatically as neuralgias, myalgias, headaches, disturbances of appetite, vision, hearing, bowel movements, nausea, indefinite abdominal pains even to severe gastro-intestinal cramps simulating gall-bladder inflammations, gall-stones, duodenal or gastric ulceration, vomiting, diarrhea, periodic attacks of insomnia, restlessness, forgetfulness, urticarial manifestations, eczemas, toothache, tingling in the extremities, fatigue upon slight exertion, and inability to concentrate the mind, while others may have like degrees of acidosis yet are apparently symptom free. It should never be forgotten nor overlooked that pathological conditions may be present at the same time which may be the cause of a number of the above symptoms or aggravating them. Again in patients apparently symptom free, sudden alarming symptoms and often fatal outcome have occurred without the slightest warning.

The special symptoms that may be observed from the different organs may be enumerated as follows:

In the mouth there is a disturbance of the secretions, the alkalinity of which is decreased, glossitis, alveolar tenderness, loosening of the teeth, cavity formation with rapid decay and loss of teeth, abscess teeth, pyorrhea, gingivitis, buccal inflammation with or without actual aphthous formation, the presence of a more or less distinctive odor to the breath, a bitter, sour or pappy taste in the mouth, vague pains to

actual toothache, diminution or actual loss of taste and loss of power to properly masticate foods. The pharynx may show nothing more than the ordinary conditions found generally which have no reference to the condition. Esophageal spasm and difficulty in deglutition, a sensation of food remaining in the organ after swallowing, with or without pain in the region behind the sternum may be noted.

In the stomach various symptoms, are likely to be more or less pronounced which may bear directly or indirectly upon the acidosis. The stomach being the mouth-piece of the abdominal cavity often elicits referred symptoms. Notably, the symptoms are nausea, vomiting, anorexia, belching, sour eructations, pyrosis, cramping pains, bloating and pressure in the epigastrium. Seldom is blood vomited and when this occurs esophageal or gastric ulcer or carcinoma is thought of. Gastric secretion and digestion may be so interfered with as to materially disturb the general nutrition. A test meal may show a marked increase in the fluid contents with a high acidity. In the small intestines the most prominent symptoms are colicky pains, borborygmi, gas distension, and increased peristalsis. In the large intestines there may be pains in either the regions of the cecum, ascending, transverse or descending colon, the sigmoid or upper part of the rectum, this being due to gaseous distension and irregular and spasmotic contractions which may become so marked and prolonged as to simulate tumefaction. We may have here a cause of the phantom tumors at times encountered. Diarrhea or constipation may be present though diarrhea is usual. When the stools are very free, frequent and painful, blood may be present. It should not be forgotten that blood in the stool could come

from other causes foreign to acidosis and be present at the same time. Degrees of excessive putrefaction and fermentation may be dependent upon high degrees of acidosis, the resultant products being absorbed increases the acidosis establishing a sort of vicious circle. The stools may show a decreased alkalinity or even an acid reaction.

The liver is often enlarged and tender, the gall-bladder may be distended and tender. At other times these organs do not give symptoms while at other times when symptoms are prominent care must be exercised to rule out a preexisting cholecystitis or cholangitis. Symptoms referable to the pancreas are difficult to detect as they closely simulate those of the stomach and intestines. The examination of the stools may bring out disturbances of pancreatic activity in the presence of much undigested albuminous and starchy foods.

An existing nephritis may complicate conditions materially as the nephritis may be due either to the irritating condition of the acidosis or to other causes. In acidosis, the urine gives evidence of the condition in the increased elimination of the acid salts and other by-products of acidosis. Indican which would be expected to be present in large amounts is surprisingly absent in a large number of the cases and quite often in the severer ones. After the severity of the acidosis has subsided indican and more often urorosein has been found.

Acidosis not being an organic disease has no pathology and the pathological findings noted are the usual pathognomonic of recognized diseases which either preceded, accompanied or followed the acidosis. It may be eventually brought out that hyperactivities of the internal secreting organs

have as the chief etiology the degree of acidosis that exists.

Of particular note in the examination of the urine is the increase of acidity, increased output of uric acid, the presence of increased amounts of acetone and diacetic acid, fatty acids, purin bodies, ammonia, and at various times, sugar, indican, urorosein and urobilinogen.

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## POST-ANESTHETIC ACIDOSIS WITH RENAL HEMORRHAGE, ACIDOSIS WITH INDICANURIA AND ANGIO-NEUROTIC EDEMA OF THE LARYNX AND ASCENDING COLON (SIMULATING APPENDITIS).

BY

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It is not within the province of this short article, in the writer's opinion, to discuss the pathology and causes of acidosis, so that he will merely describe his experience in three cases, which he believes may have some points of interest for his readers. Though he ordinarily does not make any pretence of attending children, it happened that he was especially requested as a gastro-enterologist, to care for the patients in question. The first two cases were patients of Virgil P. Gibney, who had operated upon them for orthopedic conditions. The anesthetic in both was ether (Squibbs, the best product known), the anesthetist being a skilled man. As to the operator, it is unnecessary even to refer as to his ability.

Post-anesthetic acidosis occurs, as we

know, most frequently after chloroform, though also after ether, ethyl chlorid and nitrous oxid.

*Case 1.*—This child, a girl of 8 years, began to vomit directly after operation and the vomiting persisted continuously in spite of numerous remedies. I saw the patient on about the second day, at which time not even small quantities of water could be retained. The physical examination yielded no results; there was no acute dilatation of the stomach. The history was one of a previous weak stomach and of several attacks of possible cyclic vomiting. Suspecting the possibility of post-anesthetic acidosis, I had the urine immediately examined. There were a large amount of acetone, diacetic acid, albumen, casts and blood. The urine was deficient in quantity, and of high specific gravity, no sugar. Incidentally I have seen several cases with this combination. On three occasions, in the course of the next three days, considerable quantities of *blood were plainly visible in the urine, evidently from the kidneys*. This feature is of considerable interest, as I have not seen such heretofore reported. Hot normal saline enemata were administered daily, containing in all 3*iii* sodium bicarbonate in 24 hours. In addition, small quantities of very hot water with bicarbonate of soda were given by mouth, and enemata of strained oatmeal gruel and glucose. Within 24 hours it was possible to administer a little soda bicarbonate and oatmeal gruel by mouth, though there was still occasional vomiting, which did not entirely disappear for a week. For the visible renal hemorrhage, lactate of calcium was given by enema—as much as grs. 40 daily in divided doses. The calcium lactate was continued for 3 days after the last hemorrhage as a precaution. The soda was kept up continuously for a month, being gradually reduced to 3*ii* and finally to 3*i* per day. At the end of this period the urine had become normal. The oatmeal gruel was also continued. Zoolak milk and lime water, milk and other cereals were added gradually and finally a return to a simple diet.

On the eighth or ninth day after I first saw the case, Dr. L. Emmett Holt was called in consultation. At this time the urine was very dilute—with a low specific gravity, on account of the large saline injections, and the acetone markedly decreased. The acute

renal congestion had disappeared. Holt also believed that the patient probably had had previous attacks of cyclical vomiting. The anesthetic undoubtedly was responsible for the severe acidosis.

*Case 2.*—This was also a case of Dr. Gibney's, operated on about the same time as case 1. A girl 9 years of age. She suffered from post-operative vomiting, proven to be the result of acidosis. Ether was the anesthetic. The urine showed acetone and diacetic acid, but no renal congestion as in the other patient. The vomiting was not as persistent and ceased entirely, under the same method of treatment, in two or three days. Having had no such markedly unpleasant complications, it was interesting to note two such experiences, both in children occurring at the same time.

*Case 3.*—This patient was a girl of 8 years. The mother, an office patient, requested me on a visit to my office, November 21, 1913, to give her a prescription for a simple gargle for her young daughter, who complained of sore throat. In the early evening of November 23rd, I was suddenly called to see the patient, who complained very little of the throat, but chiefly of abdominal discomfort and some tenderness on the right side of the abdomen. The mother had given a dose of castor oil the night before, as she discovered that the child had been overindulging in food. The effects of the cathartic had apparently been good. The following were the results of examination: temperature 101.8, pulse 120, respiration 22; tonsils congested but no membrane or patches, lungs and heart normal, a quite marked erythematous eruption over the thorax and extending over the abdomen (but less in this region). The eruption was not characteristic of any of the exanthemata. The patient was quite tender on pressure over the caput coli and extending a short distance up the ascending colon. The most marked area of tenderness was apparently slightly higher than McBurney's point. There was no muscular rigidity. The possibility, however, of a retroverted appendix with commencing appendicitis, suggested itself and, as a precautionary measure, I called John Erdmann to examine the case. He considered the same possibility but we decided merely to observe conditions temporarily, as there was no rigidity. The mother had seen no mucus in the move-

ments. The patient was sent to bed, a light hot water bag being applied to the abdomen, and the diet to be liquid. Stool and urine specimens were ordered. Dr. Clarence Rice examined the throat and found the same conditions as myself. I took swabs, however, as a precaution and had examination made for Klebs-Loeffler b., with negative result as expected. The following morning the urine gave information. There were a large amount of acetone, some diacetic acid, *indican marked*, a faint trace of albumen, a few hyaline casts and a few pus cells.

In view of the presence of pus, a sterile specimen was later secured and fermentation tests performed for colon bacilli. None were present. The stool examination showed *marked putrefaction, no mucus present*. I imputed the nephritis as secondary to intestinal putrefaction. Immediately on discovery of the acidosis, and indicanuria, sodium bicarbonate up to 5*iii* in 24 hours was administered in vichy. Sour milk, such as Zoolak and Fermillac, diluted with vichy and strained oatmeal gruel constituted the diet. Bowel irrigation with normal saline solution was instituted and the bowels were kept regular.

On the night of November 25, a sudden attack of spasmodyc croup occurred (undoubtedly angioneurotic edema of the larynx). This further cleared up the diagnosis, particularly in view of the fact that there was no mucus in the stool (thus excluding colitis), and that acidosis and indicanuria were present, with secondary renal disturbance, and also an erythematous eruption. All these conditions cleared rapidly under the treatment for acidosis and indicanuria, as did the tenderness over the caput coli, appendical region and ascending colon. Osler and others, as we know, describe angioneurotic edema of the colon—simulating appendicitis—with which erythemas, etc., are associated. Undoubtedly this patient suffered from this condition. Incidentally local treatment to the appendix was stopped at the end of the first twelve hours. For the laryngeal edema, syrup of ipecac was given until free emesis occurred, local heat applied, and hot steaming with benzoin tincture. Subsequently, small doses of ipecac were continued for several days, together with inhalations and local heat to the larynx. The alkaline treatment, oatmeal and sour milk, with bowel irrigation were

pushed more actively—with no further local application to the appendical region. The erythema and local abdominal tenderness gradually disappeared under this treatment and the temperature slowly fell to normal. On December 4th the patient was allowed to go to the country for a few days change.

On December 8th, urine examination showed that the acetone, diacetic acid, indican, albumen, casts and pus had disappeared (normal urine). The reaction was alkaline due to the soda which was continued for some time.

This case is of particular interest, showing the association of acidosis, and indicanuria with secondary renal disturbance resulting from dietetic indiscretions, and that these factors were clearly responsible for the angioneurotic edema of the colon, with symptoms suggestive of appendicitis. Careful inquiry demonstrated that the patient had a year previously some gastrointestinal disturbance with secondary renal complications, for the treatment of which, soda bicarbonate was the chief remedy (evidently an acidosis attack).

For some time past, I have been advocating the use of alkalies and oatmeal gruel for several days before anesthesia to prevent subsequent acidosis. The post-operative use of soda bicarbonate, oatmeal gruel and glucose would also be of value.

In conclusion, the writer trusts that this small contribution to the "Symposium on Acidosis" may prove of interest to, at least, a few readers.

103 East 57th Street.

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**A Refreshing Odor.**—An agreeable method of changing the atmosphere (*Nursing Jour. of India*) in an invalid's room is to put some eau de Cologne into a shallow dish, and with a lighted match set fire to it. The spirit will make a pretty flame, and impart a delightful odor to the air.

## THE ROUTINE TREATMENT OF OPERATIVE ACIDOSIS.

BY

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The condition of acidosis occurring during the course of disease has been carefully studied only during comparatively recent years. That it is frequently found in certain types of cases which may be clinically classed as surgical diseases, and that it is most often present in those cases in which operative interference has been necessary, was soon recognized.

The cause of the acid intoxication has not yet been clearly demonstrated. It may be relative only and due to a deficiency in the supply of alkali normally required by the organism, or the acidosis may be a positive phenomenon and due to an increased production of acid products which for some reason escape further oxidation in the body economy.

While from the modern physico-chemical viewpoint the reaction of the blood undergoes comparatively little if any change even during cases of extreme acidosis, it has been shown by Sellards<sup>1</sup> that in some conditions the blood shows distinct and easily demonstrable changes in its reaction to certain indicators, especially phenolphthalein.

Acidosis should be considered not as a definite pathological process, but rather as a condition resulting from disease. Clinically its intensity is marked by the increased acetone and diacetic acid in the urine and by a marked increase in the titratable acidity of the urine. At present, as far as is known, acidosis may be controlled, to a cer-

<sup>1</sup> Sellards: A Clinical Method for Studying Titratable Alkalinity of the Blood and Its Application to Acidosis. *Johns Hopkins Hosp. Bull.*, 1914, xxv, 278.

tain degree, by measures which lead to a diminution in these substances in the urine. Before, during, and after operation there are at work several factors which make for the increase of the formation of acid bodies in the course of certain processes of metabolism. Among these there may be mentioned nervous and muscular activity, starvation, diminished oxidation of injured and diseased tissues and possibly direct injury to the liver and other organs by the anesthetic.

Starvation causes a rapid decrease in the circulating glycogen of the blood. This diminution requires that muscular energy must be supplied at least in part, by energy derived from either proteid or fat (either directly or indirectly). It has been repeatedly demonstrated that the energy in the human organism derived from either proteid or fat in the absence of available carbohydrate usually results in an increased formation of acid bodies and that this condition carried to the extreme was incompatible with continued existence.

It has been further demonstrated that, in cases of uncontrollable acid formation (or incomplete acid destruction), the evil effects may be ameliorated and postponed by the introduction of available carbohydrate and alkalis into the human economy.<sup>1</sup>

It has been my privilege to study the operative cases at Polyclinic Hospital, New York City, under the services of Dr. William Seaman Bainbridge, and it is my purpose to outline briefly the routine treatment of surgical cases showing evidences of acidosis or in which acidosis might be expected to occur. For practical purposes extreme nervousness, protracted vomiting, long anes-

thesia, traumatic shock, and a few constitutional diseases, etc., are recognized as causes of incipient acidosis and in such cases appropriate treatment is instituted even in the absence of recognizable symptoms.<sup>1</sup> Of the symptoms which lead to the suspicion of an existing acidosis may be mentioned dyspnea, tachycardia and the characteristic acetone breath. Clinically the urine is tested for acetone and diacetic acid and when one or both are found it is believed that active treatment is indicated.

The care of these cases with reference to acidosis may be divided for purposes of discussion, into the ante-operative period, the operation and the post-operative period.

Before operation the bowels are cleared out and the patient given several ounces of milk sugar in divided doses for a few days before operation. Glucose solution, made up with one teaspoonful of glucose to the glass of water, is given by mouth, several glasses being taken during the day and, when indicated, bicarbonate of soda is given both by mouth and rectum until the urine is only faintly acid. Colonic irrigations with sodium bicarbonate solution (one dram to the pint), may be given daily with good results, the amount of solution used usually is from six to ten quarts, depending somewhat upon the indications for treatment and the condition of the patient. In serious cases, where the operation is severe and the margin of recovery is very small, these bicarbonate of soda irrigations are continued daily, as a safeguard, until the urine is alkaline, or at most only faintly acid.

Believing that wakefulness and nervous-

<sup>1</sup> In diabetes the Allen treatment (periods of starvation) has been found to diminish acidosis. However this is not always successful and even in these cases alkaline therapy is usually beneficial. Glucose therapy should of course be instituted very cautiously in cases already overwhelmed with increased circulating dextrose.

<sup>1</sup> Some recent work in metabolism would indicate that possibly alcohol also has some influence acting toward the prevention of acidosis.

ness before operation make for increased acidosis and post-operative shock, the patient is exposed to as little nervous shock as possible preceding the surgical interference and suitable rest is secured by the use of various sedatives and hypnotics, not omitting morphine when required.

During long operations, saline solution is introduced beneath the breasts, often as much as three quarts being injected during the operation. In shorter operations or when otherwise indicated 12 to 16 ounces of saline solution may be given by rectum during or immediately after the operation or, what is considered better, the same quantity of glucose solution may be substituted for the saline, made up of one ounce of glucose to the quart of ordinary tap water. In cases in which acidosis is already present bicarbonate of soda may be added to either of these solutions to an amount equivalent to one-half per cent.

After operation glucose solution is introduced per rectum in the shape of the familiar Murphy drip, the rate being limited to not more than forty drops a minute. By this means two to four quarts or more of solution may be introduced during the day. Should the urine show appreciable quantities of acetone, sodium bicarbonate is added to the drip, the proportion being one to two drams to the quart, and sodium bicarbonate is also given by mouth up to three or four teaspoonsful in twenty-four hours. More than this amount is apt to cause digestive disturbances and should be avoided unless special indications exist.

It is not possible, however, to indicate just how large the necessary dose of bicarbonate of soda should be. In some cases 4 to 6 grams may be sufficient, in others 50 or 60 grams may be required. Clinically, when the urine is faintly alkaline the soda solution is

discontinued and from this point onward the attempt is made to keep the reaction of the urine only very faintly acid.

It should be clearly understood that the proctoclysis is not given merely during the period during which oral feeding is difficult or impossible. On the contrary, it is usually given for several days in conjunction with feeding by mouth and only discontinued when the condition of the patient is so improved as to make its further use unnecessary. Occasionally the rectal mucous membrane is so irritable as to render any attempt at proctoclysis difficult or impossible. Success in these cases usually follows if the treatment is given intermittently, that is, the Murphy drip is given for two or three hours followed by a resting period of an equal length of time. More refractory cases are often relieved by a cleansing enema followed by a starch enema and a rest period of several hours.

Hyperdermoclysis and intravenous infusions of glucose solution<sup>1</sup> are available when the need is urgent, but for routine treatment the technical difficulties of their preparation often prevent their use. For hyperdermoclysis, glucose solutions should be of a concentration of from 4 to 5 per cent. and for intravenous infusions stronger solutions (up to 7 per cent.) may be used. These solutions are easily contaminated and serve as excellent culture media for bacterial growth—consequently, they must always be freshly prepared. Moreover, ordinary commercial glucose contains a considerable percentage of maltose which is not utilized directly by the organism, and chemically pure glucose is very expensive and difficult to secure. When properly prepared, however, glucose

<sup>1</sup> Burnham: Glucose Solution as a Prophylactic against Post-operative Shock. *Amer. Jour. of Med. Sciences*, 1915, CL, 43.

solutions may be given either into the circulation or beneath the skin with no more bad effects than are consequent upon the introduction of normal salt solution.

Is glucose introduced directly into the circulation utilized in the body processes? That it is, has been adequately proven by the calorimetric experiments of Vezar and Von Fejer<sup>1</sup> who found a definite increased oxidation after its introduction. From 2 to 5 per cent. appears in the urine, the remainder probably being utilized for the formation of glycogen in the liver.<sup>2</sup> In desperate conditions it should be remembered that we have in glucose the one food substance which after being introduced directly into the circulation is readily utilized by the organism and in consequence its use is not only justifiable but strongly indicated.

Should morphine be used after operation? If we are to accept the theories of Crile, and after reading his arguments it is difficult not to accept them, we need seek no further justification for the use of morphine after operation. Crile believes that fear, nervousness and wakefulness increase the formation of acids in the processes of cell metabolism.<sup>3</sup> Clinically, it appears evident that moderate doses of morphine after operation make for a lessened acidosis and a more rapid convalescence.

*To recapitulate:* The routine measures used to combat an incipient or existing acidosis should include:

<sup>1</sup> Vezar and Von Fejer: *Biochem. Zeitscher*, 1913, LII, 140.

<sup>2</sup> Laboratory experiments of Gigon and Massini tend to prove that isolated muscle is able to utilize glucose directly without the preliminary formation of glycogen. *Biochem. Zeitschrift*, 1913, LV, 189.

<sup>3</sup> Fear, nervousness and wakefulness all increase the muscular activity and this leads directly to acid formation. A direct action upon the central nervous system may have an analogous result but this has not been definitely proved.

1. Adequate nutrition by mouth especially in the form of carbohydrates.
2. Forced carbohydrate feeding in the form of glucose solutions given by mouth in the proportion of one teaspoonful of glucose to a glass of water.
3. Glucose solutions of a strength equivalent to one ounce to the quart may be given per rectum or, in some cases, subcutaneously.
4. Bicarbonate of soda solutions given by mouth, rectum or subcutaneously.
5. Saline solutions by hyperdermoclysis during the operation.
6. Morphine for the relief of pain and to prevent the evil effects of excessive external stimuli.

It is not considered that this plan of treatment is ideal, for it is evident that the percentages of the solutions used might be arranged more scientifically, and it is desirable that more laboratory work might be done in cases of the type under consideration; but it is believed that the plan outlined is a satisfactory, workable method, suitable for hospital use. The advantage of the above plan is that, in general, it has been found to be well adapted to the general routine of a busy hospital, and it is firmly believed that patients subjected to this plan show more rapid convalescence and fewer fatalities than those in whom it is omitted.

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**Ichthyol in Erysipelas.**—Dr. Helen Sexton, in the *British Med. Jour.*, reports the case of a soldier with a large suppurating wound on the inner side of the arm, in which erysipelas developed, the redness and swelling extending below the elbow. The arm was painted every twelve hours with ichthyol and glycerin equal parts, and covered with oil-silk, and a mixture containing large doses of bichloride of mercury was given. In forty-eight hours the temperature was normal, and all the local symptoms of erysipelas had disappeared; the wound was then dressed with ordinary hypertonic saline solution.

## ACIDOSIS.<sup>1</sup>

BY

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While the ancients considered the subject of acidosis as of importance in the human body, and it is now nearly a century since Prevost and Dumas first demonstrated that in nephrectomized animals the urea in the blood was increased, and while further, much is being written on the subject and good quality of investigation work is being done, nevertheless, it may honestly be said that so far as the subject at the present day is concerned we are still students in it in a practical way. Here and there, however, there is now considerable of value to physicians in both diagnosis and prognosis, although the correlation of the laboratory findings with the clinical condition is not generally easy. By acidosis is meant increased acidity, or to be more accurate, a decreased alkalinity of the blood. At first it was supposed to be limited largely to people suffering from diabetes or from advanced cancer, diseases in which there were more or less marked disturbances in the metabolism. For a long time it was considered that the presence of acetone was an indication of pathological change. In addition to this substance, Gerhardt detected in the urine something which gave a dark red wine color when a solution of perchloride of iron was added. He thought that this was diacetic ether and the material from which the acetone was derived. Later on it was determined that it was diacetic acid. Further investigation sug-

gested that diacetic acid and beta oxybutyric acid were substances from which acetone was formed and that the latter was comparatively harmless. It was at first thought that these substances were derived from the breaking down of protein materials but the more recent view is that they are formed from the fats. In time, acetone was found in many other conditions, such as pneumonia, scarlet fever, typhoid fever and nephritis. It was noted also in urine after operation, particularly when chloroform was used; if already present it was increased in amount. As a rule, the greater the amount of acetone the less that of beta oxybutyric acid. Usually in diabetic coma the acetone is comparatively lacking while the diacetic and oxybutyric acids are increased. Then of clinical importance is the fact that there are times when diacetic acid is the only one of the three found, and the clinical symptoms do not in any way indicate disturbance. It is evident, therefore, that a diagnosis of acidosis must frequently rest on something more than findings in the urine of any one of the three substances mentioned. Thus, clinical symptoms in the course of a disease must be taken into consideration and the diagnosis made with the assistance of the urinary findings but not based upon them alone.

In the advance of scientific medicine new and more exact methods of diagnosis are constantly appearing. It was a great step forward when knowledge of metabolism and diseases of metabolism reached such a level that definite diagnostic and prognostic data could be ascertained by laboratory means. Here and there as time goes on the utilization of these data and this means of examination are advancing the subject. Calorimetry, likewise, has made no small contribution. To this, finally, may be added

<sup>1</sup> Remarks made before presenting cases at Prof. Bassler's lecture at the New York Poly-clinic, January 3, 1916.

the advances that have been made in the study of foods and particularly the hydrolytic end processes of digestion. Finally within the last few years, instead of depending upon the diet alone or upon the urine findings alone, examinations are being made of the expired air, the various constituents of the blood contents, excretion from the body such as feces, sweat, and so on. Naturally it is quite difficult to speak with any degree of definiteness on the entire subject. There are so many inaccuracies evident in the examination of most cases, and in the definite statements made here and there in the literature, that in trying to conclude this to vital data is almost impossible. This is added to by the fact that every method of examination or any tissue or excretion examined has its technical difficulties and thus its limitations. No doubt as time goes on the entire subject will be worked out so that it will have a particular value as a means of diagnosing those hidden problems of vital functioning and this will be practical for clinical use.

Since the concentration of carbon dioxid in the alveolar air corresponds to that in the blood, and since concentration in the blood decreases as other acid bodies increase, it is evident that the concentration of carbon dioxid in the alveolar air gives a direct and immediate quantitative gage of the degree of acidosis. This being accepted, Francis Peabody in an extensive study of the alveolar air as an index of acidosis has made an interesting report from the medical clinic of the Peter Bent Brigham Hospital in Boston. In diabetes in which acidosis so commonly plays a preeminent role the production of abnormal products of fat metabolism such as aceto-acetic acid, acetone and beta oxybutyric acid may go on for some time without clinical symptoms. The

blood compensates for the acid addition by an automatic chemical readjustment which maintains the blood reaction near its normal. Without going into the many points pertaining to this method of examination it may be said that an analysis of the carbon dioxid tension of the alveolar air gives promise of furnishing a useful aid in estimating the severity and course of acidosis. Peabody found that when the alveolar carbon dioxid fell below normal the patient entered a danger zone. Between 30 and 35 mm. of carbon dioxid indicated considerable acidosis and the need of treatment, but a tension between 20 and 30 mm. is much more serious and requires the closest oversight. He states: "A constantly falling carbon dioxid tension is a serious warning and is of great prognostic value. If the carbon tension is down to 20 mm. or lower, the patient has reached the state in which coma may suddenly appear." In one case of diabetic coma the alveolar air showed only from 6 to 10 mm. of carbon dioxid. Thus, it is evident that the alveolar air will give an accurate index of the effect of treatment in acidosis.

In chronic nephritis there is an acidosis due to retention of acid products in the circulation owing to inability of the kidneys to excrete them. This is shown by the fall in the phenol output and by the increase in non-protein nitrogen in the blood. Because of retention due to the kidneys not eliminating properly, urinalysis does not give much aid in determining the degree of acidosis. Peabody found that in cases of uremia in chronic nephritis in which air-hunger and acidosis play a prominent role, the characteristic fall in alveolar carbon dioxid is present and gives the same guide for prognosis and treatment as in diabetes. In cardiac dyspnea Peabody found two

principal types. Many showed a decreased carbon dioxid tension, indicating an acidosis which rapidly disappears with improvement in the circulation, and a certain group presenting evidence of a more serious acidosis together with inefficient renal function. These cases of true cardiorenal disease owe their dyspnea probably to retention of nephritic acidosis. It is hard to estimate the exact value of the acidosis producing this type of dyspnea but one can accept that it is an important element.

Along about the middle of the last century more accurate quantitative analysis was made of the blood to study the subject of the blood urea in connection with the protein intake. Piacard, Tileston, and Comfort were important investigators who added to the advance of this information. With the development of the technique urea estimation and particularly with the urease method of Marshall, described in the *Journal of Biological Chemistry*, rather quick advance is being made. This taken with the uric acid and total non-protein nitrogen which is studied by the methods of Folin and Denis, described in the same journal, makes rather a complete method of estimating these bodies. It is desirable, too, in making estimation of retention of nitrogenous waste products in the blood that the estimation of the hydrogen ion concentration by the methods of Rowntree and Levin, such as described in the *Archives of Internal Medicine*, be utilized, and of course the methods above mentioned of estimating the CO<sub>2</sub> tension of Fredrica is to be added. The normal values for urea in the blood are considered to be from 12 to 14 mg. of urea nitrogen, uric acid 1-2 mg., of the total non-protein nitrogen 23 to 25 mg., each estimated for 100 c. c. of blood. A tendency lately is to raise the amount of

non-protein nitrogen to 30 or 35 as within normal limits. It may be stated definitely that according to the quantity of protein ingested, and according to the ability of the kidneys to secrete, amounts of protein are found in the blood. One often sees cases of renal deficiency who are on excess protein diet, who run a high non-protein content of the blood producing symptoms, and who, when the diet is regulated according to the efficiency of the kidneys to excrete the nitrogen, have the symptoms disappear. In a way the proper understanding of this subject must be viewed in a relative light, or one would never understand it completely. While the largest number of cases of nitrogen waste retention are some form of nephritis, there are other pathological conditions which may produce it, among which may be mentioned, anemia, leucemia, acute infection and pneumonia and cardiac decompensation. In pyloric stenosis, intestinal stenosis, or any condition in which there is vomiting, we commonly find an increase in the nitrogen waste in the blood. But, as I stated before, these must all be viewed in a relative light because some of the conditions have associated an increased catabolism which, if accompanied by much intermediate acid formation, gives rise to slight acidosis which in time decreases renal function, and others, as was stated in the beginning, are due to renal disease primarily.

In mild cases of nephritis one often sees retention up to 40 mg. of urea nitrogen, and in advanced cases of chronic nephritis values of from 60 to 140 mg. of urea nitrogen is the rule and thus requires most careful treatment. It is stated, and now rather generally accepted, that when the retention of urea nitrogen reaches 90 to 100 mg. the prognosis is grave. Exidus occurs usually

in less than a month. I have, however, observed cases which have gone on as long as 5 and 6 months, of course, they being on a rigorous regime during the time. Then again, it is not unusual to see cases, not due to decompensated hearts particularly, but to chronic nephritis, in which as much as 90 or 100 mg. of nitrogen content is found in the blood, which, after intensive treatment, make considerable improvement so that the urea nitrogen may fall as low as 40. Of course, the general rule in chronic nephritis is, if the non-protein nitrogen content is within a reasonable limit (that is comparatively low), the patients do well when on a low diet, alkalies, graduated exercise, mental and physical measures, and so on, a case can be kept so that the content is perhaps not above 40 mg. The prognosis, then, for continuation without symptoms is comparatively good. I have seen five cases of prostatic hypertrophy wherein the output of nitrogen in the urine was deficient, and in which the content of the blood was high, cases which did not show, so far as careful examination of the urine and the phenol test were concerned, any definite structural disease in the kidney parenchyma.

Medicine in the past was based entirely upon gross pathology and microscopical pathology and these comprised the basis of the consideration of disease. The deficiency of these in matters of medicine has led to the investigation of subjects such as mentioned, and the advancement of conditions that may be classified as deficiencies of function. We are now getting into the realm of chemistry and physiological chemistry rather than pathology distinctly, or rather chemistry and physiological chemistry caused by pathology, and we are getting a better understanding of disease in the way of its symptoms and treatment.

After all, it is not so important to patients whether we find exactly what combination of diseases exists, or what the status of pathology is since one stage often merges into another, and it is often impossible to deduct clinically just exactly what the pathological status is. But it is important in so far as the treatment of symptoms is concerned (and that is what patients come to us for) to know just what the functioning powers of the various organs are and the correlations that surround the various aspects of the subject of acidosis. Thus it is that in the methods of examination mentioned, these must be utilized in the present status of the subject so as to give to people the best that can be done by the science of medicine today. As time goes on, new methods will be found, and we will gain a still better understanding of the subject as a whole. No doubt then, the subject of acidosis will receive better attention, a practical aspect which will be more useful than it is today, although many of the aspects as learned now are well worth the while in clinical work.

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**Treatment for Pellagra.**—Dr. Swarts in *Med. Summary* gives the following treatment for pellagra; this consists of placing a piece of fly-blister about the size of a half dollar upon the breast, or some part of the anatomy least exposed to friction. Let it remain for sufficient length of time to draw a good blister. After the blister has been formed, draw out with a sterile hypodermic syringe, one or two cc. of the fluid, and inject intra-muscularly, and allow the remaining fluid, if there be any, to absorb, dry up or go away, as it will.

This treatment should be repeated every seven days, until six or seven treatments have been taken, at which time the patient will be greatly improved in health, and the symptoms entirely disappeared.

## THE TREATMENT OF ACIDOSIS.

BY

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Acidosis, acid intoxication results from the withdrawal of certain bases normal to the organism because of an excess of acids in the fluids and tissues of the system. It would be interesting to trace the chemistry or origin of these offending substances, the acetone bodies, but the scope of this thesis is limited to the therapy of the condition. However it will be necessary to touch lightly upon certain phases of etiology, pathology and prognosis in order to make clear the question of treatment.

Lest we forget, it may be well to remind the reader that while acidosis occurs typically in diabetes mellitus and is invariably the danger signal of diabetic coma, it occurs in other complaints such as in starvation, anemia, disturbances of the gastrointestinal tract, exhausting fevers, pneumonia, the toxemia of pregnancy, gastric ulcer, cancer, after operations and general anesthetics especially chloroform, in diarrhea, recurrent vomiting and in cachectic conditions.

The seriousness of a condition of acidosis will be appreciated when we remember that one of the most essential elements of respiratory functions is the removal of carbon dioxide from the blood and tissues. This is normally brought about by the alkaline component of the blood. In acidosis, this alkalinity is neutralized by the acids present in the circulation, resulting in a serious condition of marked dyspnea, not so much from a lack of oxygen as from an excessive accumulation of carbon dioxide. These facts will account for the more prompt and lasting relief from an intravenous infusion

of an alkaline solution than from the inhalation of oxygen.

There is lack of nitrogen equilibrium and dyspnea results. The nitrogen is used up without increased intake, while that in the tissues is called upon to replace the protein of the food.

Conceding, therefore, that an acidosis or acid intoxication result from the withdrawal of certain bases from the organism as the result of an excess of acids in the system, it is obvious that the treatment will be the introduction of alkalies or antacids into the circulation, not only to neutralize the acids themselves but as well to prevent the further withdrawal of the bases from the body, and thus allow of the reaccumulation of these same bases which have undergone chemical changes and as such been removed from the body. Only thus can we succeed in reestablishing the normal equilibrium necessary to maintain a measure of health; for to the extent that we reestablish normal equilibrium—normal alkalinity of the fluids—do we bring about a measurable degree of health. To the failure of oxidation of the acetone bodies, beta-oxybutyric acid, diacetic acid and acetone is due the inhibitive oxidation process resulting in acid intoxication or acidosis.

In diabetes, acidosis is a condition which should be carefully guarded against; the same is true of other conditions; when acetonemia is present, and there is inability to take food, the patient is in danger and should be watched day and night.

The best alkali for use in acidosis is unquestionably sodium bicarbonate which may be administered by mouth, rectum, subcutaneously or intravenously; preferably by the mouth in the absence of vomiting. It will be found advisable to give it in solution in water, but in some instances, especial-

ly to children or infants, it may be given in orange or grape juice. The solutions should not be stronger than, preferably one to thirty or even one to sixty. It is generally thought that as much sodium bicarbonate should be given as the patient can tolerate, without untoward symptoms. It must, however, be kept in mind that excessive amounts of sodium bicarbonate may cause vomiting, diarrhea or even pronounced symptoms of poisoning. Other alkalies maybe, have been used in conditions of acidosis, but they will not be found to give as prompt and satisfactory results as the sodium bicarbonate.

When the sodium is given by the rectum in the absence of diarrhea, the solution may be increased in strength to one to ten (1 to 10). When subcutaneously, a two per cent. solution should be used. Intravenously a four per cent. will be found sufficiently strong. The dose subcutaneously or intravenously should, however, be determined by the age and physical condition of the patient, as well as the urgency of the desired relief.

Inasmuch as the acetone bodies are formed chiefly from the body fats in the absence of carbohydrates, or when there is disturbance of carbohydrate metabolism, it is conceded that an easily and quickly utilizable carbohydrate is indicated. This may be in the form of glucose or dextrose, either of which may be given by mouth or rectum. A favorite method employed by John Lovett Morse of Boston, is to give a 5 to 10 per cent. sodium bicarbonate in a 10 per cent. solution of dextrose.

It will be found that a thorough cleansing of the intestinal tract is advisable in the beginning of treatment.

The above is an outline of treatment for acid intoxication as this condition is a sequel to or complication of the primary condition. The acidosis should be promptly re-

lieved, otherwise the patient may succumb to the secondary effects of the complaint. This relief secured, efforts should be resumed to relieve the primary cause of the patient's condition, for to relieve the acidity of the blood does not imply a cure of the existing abnormal condition that brought it about, but merely a temporary relief of an emergency condition; the tendency is to recurrence. A reestablishment of normal metabolism is to be sought for and this can best be brought about through properly assimilated food. Carbohydrates as above stated are to be utilized in character and quantities to suit the individual case. Thus the nitrogenous excretion will diminish and acidosis lessen.

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## A DISCUSSION OF CERTAIN CRITERIA OF ACIDOSIS AND THEIR CLINICAL APPLICATION.

BY

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For the past five years, in both my laboratory and my clinic, my co-workers and I, among other problems, have been investigating the relation of acidosis to surgical problems, our attention having been turned in this direction in research on exhaustion. Since exhaustion from any cause—emotion, exertion, infection, surgical shock, or hemorrhage presents certain phenomena identical with those produced by the intravenous injection of an acid, such as hydrochloric acid or sodium acid phosphate, and since certain histologic lesions in the brain, the adrenals and the liver are common to exhaustion from any cause including that produced by the injection of an acid, we therefore,

thought that a study of the H-ion concentration of the blood under the same conditions as those producing exhaustion showing histologic changes might throw light on this point. To this end, in association with Dr. M. L. Menten, by the gas-chain method of Michaelis, we studied in the clinic and the laboratory the effects upon the H-ion concentration of the blood of infection, of exertion, of emotion, of inhalation anesthesia, of auto-intoxication, and of certain drugs. We found that, owing to the high efficiency of the mechanism by which the normal alkalinity of the body is maintained, no changes in the H-ion concentration were found excepting in cases in which some pathological condition had impaired the regulating mechanism; or after an activation so intense that the regulative function of the body could not keep pace with the production of acid. Thus, we found that intense emotion, extreme physical exertion, physical injury, interference with respiratory exchange, acute hemorrhage, and inhalation anesthesia, each produced increased H-ion concentration of the blood, which returned to its normal alkalinity at varying periods after the cessation of the experiment. Insomnia, however protracted, did not alter the H-ion concentration of the blood.

Although these studies yielded knowledge by which we gained important clues to the interpretation of certain clinical observations, and certain pathological conditions, yet they showed that this method would be of no clinical value in the study of individual cases, since the H-ion concentration of the blood increases only after the factors of safety have been overcome. In the clinic, for example, increased H-ion concentration of the blood appeared only in the early stages of dissolution. Thus we confirmed the conclusions of Michaelis and abandoned

the hope of using the gas-chain estimation as a clinical method of value.

In both the laboratory and the clinic, Dr. W. B. Rogers and Dr. W. H. Crozier studied the H-ion concentration of the urine, and made estimations of the acid excretion in the urine, following the methods of Professor Lawrence Henderson; and we also applied his methods in a study of other fluids in the body. Our results were of scientific interest, but we soon found that in certain bad risk patients the acid content of the urine would be normal. For example, certain cases clearly inoperable because of the degree of exhaustion existing showed normal acid excretion in the urine.

So the hope that this method would prove clinically available was in turn abandoned.

It then occurred to us that the measurement of the reserve alkalinity ought to prove an efficient standard whereby to determine the surgical status of a patient, and to this end Dr. Rogers made observations of the reserve alkalinity of the blood under various conditions, using the method of Van Slyke. Here again we were disappointed, because, although the reserve alkalinity of the blood could be determined readily enough, there still remained undetermined the factor of safety as determined by the condition of the component parts of the mechanism by whose activity the normal H-ion concentration of the blood is maintained. So here also our studies failed to show any constant relation between the surgical risk and the reserve alkalinity; and this method also proved disappointing as a clinical aid.

In short, while estimations of the H-ion concentration of the blood, of the acid excretion in the urine, and of the reserve alkalinity of the blood, furnished valuable scientific data, by means of which clinical

data may be interpreted, no one of these methods is available as a reliable indication of the factor of safety in individual cases.

One fact, however, was made clear by these studies, and that is, that the potential power of the body to neutralize acid by-products is the factor by which the safety of the surgical patient is to be measured. By as much as the patient's power of neutralizing acids is limited or diminished, by so much is his margin of safety narrowed; and a patient whose power of neutralization is lost is an absolutely fatal risk.

To illustrate: The H-ion concentration and the reserve alkalinity of the blood of a patient with exophthalmic goitre may be normal, and yet the liver of that patient may have become so impaired by the disease that any increase in acid by-products caused, by the emotions, the trauma, or the inhalation anesthesia incident to a surgical operation cannot be neutralized.

However, although we have no laboratory method by which the factor of safety in the individual patient may be correctly determined, there has been evolved within the organism a biologic response to variations in the alkalinity of the blood, which can be utilized as a clinical test—the veriest commonplace of the clinician, the respiratory exchange.

As the researches of Yandell Henderson and others have demonstrated, the respiratory rate is governed by the carbon dioxide content—the H-ion concentration of the blood. The clinician knows that physical exertion, emotion, infection, hemorrhage, cause an increased respiratory exchange. He knows that any limitation of the function of the organs of acid neutralization and elimination, as of the lungs in pneumonia, of the kidneys in nephritis, of the liver in cirrhosis, is accompanied by in-

creased respiration. The clinician knows that whenever either the volume or rate of flow of the blood that carries the acid by-products to the eliminating organs is lessened, acid elimination is impeded and the respiratory exchange is increased. Thus the respiratory exchange is increased in hemorrhage, in shock, in cardiac failure.

The clinician, therefore, has at his disposal a more accurate test of H-ion concentration than the physical chemist. Every surgeon knows that as an operative risk, the patient whose respiratory exchange, while quiet in bed, is above normal, is impaired in direct ratio to the increase in the respiratory exchange. When the respiratory exchange is accelerated, therefore, the surgeon may know that, either by faulty acid elimination or by excessive acid production, the H-ion concentration of the blood is increased; he may visualize the physical changes in the brain, the adrenals and the liver, which are the invariable accompaniment of increased acid production and accumulation, and fortified by this knowledge he will organize his campaign. The greater the accumulation of acid the stronger the respiratory stimulus, and the greater the difficulty in holding the breath.

An important application of this biologic test for acidosis has been made by V. A. Stange regarding whose findings Yandell Henderson makes the following statements:

"He, (Stange), states (correctly) that the normal period is between thirty and forty seconds. He considers any period under twenty seconds as contra-indicating general anesthesia. While he appears to have no suspicion as to what it is, as we believe, which the test really depends on and indicates, namely, acidosis, he nevertheless reports observations on a number of chronic diseases in which he finds the duration of voluntary apnea to be abbreviated

in about the degree in which acidosis is known from the results of other observers to occur." (Henderson: The Time That the Breath Can be Held as an Index for Acidosis, *Journ. A. M. A.*, lxiii, 318).

### THE PREVENTION AND TREATMENT OF ACIDOSIS.

Although our efforts to find a method by which the *degree* of acidosis or its imminence may be determined have proved unavailing, yet in the light of laboratory researches and clinical observations, the clinical signs of the presence of acidosis are unmistakable. The available methods of prevention are obvious, and the means by which an established acidosis may be treated are limited.

We know that acidosis may be caused: (a) by an intake of a smaller amount of alkalies and bases than are required to maintain an alkaline or neutral state; (b) by an excessive rate of acid production; or (c) by interference with one or more of the organs of acid elimination.

The symptoms of acidosis are increased respiration, to the significance of which we have already referred, increased pulse rate, progressive loss of mental and muscular power, restlessness, and in extreme cases delirium and unconsciousness. Usually the face and extremities are flushed; there is sweating and the face appears shrunken. This combination of symptoms is identical with that exhibited in physical exertion, emotion, infection, and preeminently in exophthalmic goiter; in starved cases of cancer or ulcer of the stomach, etc.

We know also that H-ion concentration is controlled by these agencies; (a) the elimination of carbon dioxide by means of the respiratory organs; (b) the breaking down of the acid by-products by the liver;

and (c) their elimination by means of the kidneys and the skin.

The treatment of acidosis, therefore, resolves itself into three prime factors:

(a) The control of those factors in the patient's internal and external environment which cause increased acid production.

(b) The dilution, neutralization and elimination of the acid by-products by water and alkalis.

(c) The repair of the lesions by sleep.

The control of the external environment means the elimination of worry and anxiety and the promotion of rest and above all, of sleep. Our experiments have shown that the histologic lesions caused by the injection of acids directly, as well as those caused by emotion, exertion, etc., are repaired only by sleep. Rest without sleep diminishes acid production and prevents further damage to the brain, the adrenals and the liver, but the restoration of these organs can be accomplished only in sleep. The acid producing factors in the internal environment, as in infection, as in the external environment, can be measurably controlled in suitable cases by morphine. If the case is operative, the surgeon must ever bear in mind the acid producing effects of physical trauma and measurably protect his patient by applying the principle of asepsis in each step of the operation itself, in extreme cases by the use of the lightest possible nitrous oxide anesthesia or analgesia; and by tactful pre- and postoperative management.

The value of alkalis in the treatment of shock was demonstrated in 1903 by Howell, whose conclusions have been corroborated by other workers, notably by the researches of Seelig in collaboration with Tierney and Rodenbaugh. Our researches, which identify the histologic lesions of

surgical shock with those of acidosis, give further evidence of the value though limited, of alkalies in the treatment of acidosis from any cause. The value of sodium bicarbonate in the treatment of acidosis, notably in the treatment of acidosis in children, has been admirably demonstrated by Howland and Marriot. Alkalies should be pushed, therefore, in every case, in which the typical symptoms of acidosis are present; in which the disease processes directly affect either the great acid neutralizing organ—the liver—or the acid eliminating organ—the kidneys—in which the production of acid is so rapid that the normal processes of neutralization and elimination cannot keep pace with it, as in exophthalmic goiter, for example; in any case, in fact, in which the patient's reserves have been reduced. But unhappily alkalies have only a limited power of overcoming acidosis, in many instances they have apparently no influence.

For the promotion of acid-elimination, water should be given freely by mouth, by the Murphy drip or by infusion. In serious cases as much as 2,000 cc. should be given subcutaneously in 24 hours.

Summing up our clinical and experimental studies we conclude that clinical observation gives a more accurate test of acidosis than any laboratory method. The sensitivity of the respiratory centre in its specific response to the degree of H-ion concentration is a human biologic test of greater delicacy than any known laboratory test. Finally we are forced to conclude that acidosis like blood pressure, like heart rate, like exhaustion is an end effect, beyond which lies the ultimate solution of the problem.

## ACIDOSIS IN INFANCY AND CHILDHOOD.

BY

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Acidosis, acid intoxication, with its accompanying phenomena of cyclic or recurrent vomiting<sup>1</sup> is a condition little understood, a name loosely used leading the physician to a mountain of doubts and perplexities. Monographs have been written upon the subject ascribing the acetone bodies found in the urine as the cause whereas these bodies are found in normally healthy infants and children. If, as Howland and Marriot say, we speak of a slight production of acids in the body as acidosis we might as well say that acidosis is the rule in health, for acids are always being formed within the body and means are always being found to neutralize and get rid of them. Abnormal acids may be found in the urine or in the blood showing changes in the ordinary metabolic processes; they do not necessarily mean acidosis, for the functions of the body may by no means be interfered with, these acids being in themselves not essentially toxic and harmful to the body, but only so in the fact that they remove bases. As for illustration,—bicarbonate deficiency in the plasma (Howland and Marriot). Severe and fatal acidosis may occur where no abnormal acids are found. Acidosis in children results from the production of abnormal acids as observed for instance in recurrent vomiting. Here the acetone bodies are produced in excess. Sajous mentions acidosis as due to bacterial putrefaction of the gastrointestinal canal contents and probably to beta oxybutyric and acetylactic acids formed when the intestinal fats are split into fatty acids and glycerine.

These two acids preserve their identity in the alimentary canal but when they reach the blood and tissues they are finally broken up into acetone and carbon dioxide. It is only when an abnormal amount of such acids occurs in the blood that the morbid phenomena of acidosis are awakened. This is probably the result of a gradual reduction of the tissue alkalies until a point is reached where the latter are inadequate for normal metabolism. An insufficient amount of alkali is present to neutralize the existing acids. Coma then results from the retention of carbon dioxide arising from the above process. Acidosis according to Langstein and Meyer means incomplete fat and proteid metabolism due to functional or inorganic diseases of the liver or due to carbohydrate starvation. It is generally agreed that the carbohydrates are important factors in fat and protein metabolism. Beta-oxybutyric acid is formed if the carbohydrates are absent. Oxybutyric acid is not easily demonstrated in the urine but this acid splits up into acetone and diacetic acids. These acetone bodies according to Abt are present under varying conditions. In certain infectious diseases acetone persists in spite of considerable carbohydrate ingestion due no doubt to some basic alteration in metabolism. It is found in the urine of children recovering from chloroform narcosis, in certain gastrointestinal disturbances, after certain forms of poisoning as after phosphorus, atropin, morphine, lead, antipyrin, etc., also after infectious diseases such as diphtheria, scarlet fever, measles, typhoid and starvation from any cause. Sometimes it is seen in apparently healthy babies at the weaning period. Howard believes that it may coexist with tonsillitis, coryza, bronchitis, otitis media, intestinal stasis, adenoids, diseased hypertrophied ton-

sils, diarrheas, and in cases of difficult teething. Many children show rheumatic, cardiac or choreic tendencies. Certain children seem predisposed to recurrent attacks of cyclic vomiting. Constipation is in my experience generally the rule. Often just before attacks the bowels may be, however, open.

Langmead and Ewing practically agree that the condition is a deficient oxidation of fats by the liver in consequence of the impairment of the liver functions by toxins from the gastrointestinal tract, or from bacterial activity in other parts of the body. Rackford believes it to be an autointoxication with hepatic derangement causing the accumulation of purin bodies in the blood. Howland and Richards call it an unstable state of the nervous system, as shock causes a disturbance of metabolism with the circulation of unoxidized substances in the blood. Ely speaks of it as a neurosis. Janeway and Mosenthal believe it to be a carbohydrate starvation. Sedgwick found creatin in the urine of children subject to recurrent vomiting. Cathcart speaks of it as a deficiency of carbohydrates, or an inability to use such as are present within the body. Carbohydrates are necessary for protein and fat metabolism always. "Toxins" says McCleave, "cannot by any of the conditions above mentioned act primarily upon the liver; they accumulate by dietetic indiscretions through excitement, fatigue, etc." The carbohydrate digestion is probably first disturbed. The reserve supply of glycogen in the liver is not so large in children as in adults and is perhaps drawn upon or disturbed unduly. This disturbs the fat and protein metabolism. Lowenburg points out the fact that our little patients subject to acidosis may in infancy have suffered from scurvy, marasmus or rickets.

To recognize acidosis in older children is not difficult but in infants it is much more so. In the former the character of the breathing, the vomiting and certain laboratory tests for the acetone bodies are our guides. Where diarrhea is present a positive diagnosis is often urgent as acidosis frequently coexists with the diarrheas and with fatal terminations. Symptoms may occur in apparently healthy, robust and large infants or children. Their weight curve may be stationary for several weeks before the onset. In breast fed infants the mother's milk is often to blame. Many infants may be long artificially fed before signs of acidosis appear. Gastrointestinal symptoms, diarrhea, constipation and usually vomiting usher in the condition. These little patients are restless, with possibly moderate fever of 101° F. which may even drop to 99° or 100° F. Each case seems to have its own symptom-complex except the hyperpnea which in my experience is constant. There may be distention of the abdomen, meteorism, dyspnea, Cheyne-Stokes type of respiration, and enlarged liver.

Metcalf of Concord, N. H., gives data of a seeming epidemic of acidosis citing a hundred cases seen in infants and children. These infants were less than 12 years old. Eight were between 1 and 2 years; a larger number between 2 and 8 years. Many of them lived on an apparently conservative and healthy diet. Among them were cases suffering from adenoids, asthma, follicular tonsillitis, pneumonia, coryza or bronchitis. Most of the cases were ill for the first time, several were recurrent. The onset was usually sudden with perhaps prodromal symptoms of colds, coryza and vomiting as the first signal. Besides this there was noted a coated tongue, a flushed face, often drowsiness, thirst, prostration, nervousness,

air hunger cyanosis, mouth pallor, at times a retracted abdomen, at other times there were cerebral disturbances, and enlarged liver. In the more severe attacks Metcalf found greater prostration, severe wasting and more marked cerebral manifestations. In fatal cases there was great loss of fat, emaciation, sunken eyes, tightly drawn skin and delirium.

The temperature may range anywhere from 100 to 104 or 105° F. The acetone bodies are best found during the acute period of attack. A fruity odor of the breath is often not observed in many cases. Metcalf points out the fact that acetonuria never ceased while the urine was markedly acid. He noticed the acetone bodies in the stools and vomitus but only in minute traces.

Howard has seen cases under four days. He found acidosis among rich and poor alike. The vomiting is usually more severe during the earliest stage and when acidosis is more fully developed may cease. There is, however, no certainty of this. In very young children and in almost all infants there is found to be a great distaste for food and a great desire for water or liquids. In my own experience attacks have been preceded by prodromal symptoms which have at least given me some idea of an intense intoxication such as listlessness, coated tongue, anorexia, a bluish ring about the mouth and under the eyes, a dusky, dirty looking skin upon the cheeks, headaches, at times slight or severe suffusion of the eyes, cough more or less constant, often intense nervousness, at times also meningismus. Coma may eventually develop. The face is pinched, pale and at times cyanotic. The eyes which at first are abnormally bright may become sunken and dull, the lips become dry and cracked. The teeth

are covered with sordes, the tongue is dry, often brown over the dorsum with strawberry like edges, the abdomen usually is retracted unless meteorism is present. There is usually general wasting, the skin on the body may be dry, harsh and often scaly. The sickest, sweet odor of acetone may in severe cases permeate the room. The respiration as before remarked, Cheyne-Stokes in type, is sighing and irregular as the condition depresses both the respiratory and vasomotor centers of the brain (McCleave). Vomiting is almost always present, and in my own cases was constant, except in the very mild types, which possibly as far as acidosis is concerned we may place in the doubtful class. The vomiting may be intractable and as Tobler suggests due to an increased susceptibility of the gastric mucosa. It is rarely dangerous except in the very young, in the very weak, or in greatly emaciated individuals. Acidosis may cease spontaneously after which the child seems hungry, and moist palms, a sweating of the head, of the shoulders and of the feet may be in evidence. Moreover the knee jerks may be exaggerated or absent. Also the child may later experience an abnormal colic, a general malaise, and a tingling of the finger tips. Yawning, insomnia and a numbness of the fingers and of the toes is usually, when present, seen in the early morning, owing to the absorption of poisonous products from the gastrointestinal tract during sleep, as well as to a suboxidation with the accumulation in the blood and tissues of sarcolactic acid and carbondioxide. As already remarked either constipation or a diarrhea may be co-existent with acidosis. Constipated stools may be similar to those seen in routine findings, and are brown, yellow, black and strongly acid. Diarrheal stools may be

watery, foul, green or gray, frequent, light colored with mucus, but never with any blood.

The vomitus is usually watery—pea soup in character, with much bile colored mucus and strongly acid.

The pulse is often, yes usually, small and quick and the second sound of the heart may be accentuated. There is an increased blood pressure.

The appearance of diacetic acid according to Metcalf, would seem to indicate failing powers of oxidation. It is found in a strongly acid urine and appears to be a danger signal.

The urine usually scanty may contain albumen, hyaline and granular casts and often with blood adherent. Leucin and tyrosin are sometimes found. Often a clear urine is observed, again a turbid one. The specific gravity ranges from below 1010 to above 1030.

The blood of infants and children suffering from acidosis shows no seeming pathological changes, the leucocytes range from 9,000 to 12,000 and there is no change in the differential count.

The reflexes in our little patients seem to be normal or nearly so. Intestinal atony may exist at the end of the disease and as a result no gas or feces can pass voluntarily or often even with the aid of therapeutic agents. Abdominal distention increases and cyanosis and coma set in. The pathology of acidosis is obscure. Necrotic changes have been observed in the gastro and intestinal mucosa with some degeneration of the glandular epithelium, while small hemorrhages and ulcerations with fatty infiltration of the liver have been remarked. It is well to lay stress upon the fact that the acetone bodies may in themselves be harmless and dangerous only when they remove

bases. With better understanding of the biologico-chemical processes within the body, our enlightenment as to the cause of this condition will be clearer. In brief, hyperpnea and acetone bodies in the urine together with diacetic acid offer us a positive recognition of acidosis where and whenever found. In infants which are restless and crying it is most difficult to say when hyperpnea is present.

When we approach the treatment of acid intoxication we find ourselves upon dangerous ground. Our own experience, the laboratory, the teachings and observations of others all enter into the subject. The body needs proteins, fats, carbohydrates and mineral salts. It has been proved that the exclusion of carbohydrates from the food or diminution in their amount of assimilation may lead to increased elimination of the acetone bodies. The carbohydrates then are not acetone formers. Therefore in the treatment we have to deal with, —firstly, the exclusion or diminution of the carbohydrates, secondly, in the removal of sodium from the plasma in the form of the bicarbonate, and thirdly possibly in the too great elimination of the lime salts from the body or to their small ingestion. The giving of alkalies and some form of assimilable sugar is essential. Alkalies may be given *per se* or through the assimilation of foods containing them. Carbohydrates may be given either as glucose or in some foods containing them also in an assimilable form. Alkalies, employed directly may be given by the mouth, by the rectum, subcutaneously or intravenously. If rapidity of action is desired the latter method is the best one. The external jugular or femoral veins are the best places to inject in infants, the median basilic vein in the arm is, however, preferable in older children. Howland and Marriot suggest a 4% solution of bicarbo-

nate to be used intravenously, while for subcutaneous use a 2% solution is found suitable. The quantity is dependable upon the size of the child, the severity of the symptoms and the effect produced.

Alkalies must be given until the urine becomes alkaline or neutral, and sometimes a very high alkaline tolerance is observed. In the cases where no sugar is found in the urine, for sugar is found there in a small number of cases, and there is a low sugar content of the blood, glucose can be administered by rectum, subcutaneously or intravenously along with the alkalies (Howland & Marriot).

During convalescence water, and liquids such as fruit juices are craved. When the very acute condition in children is somewhat relieved food should be started slowly with moderate amounts of proteins, carbohydrates, fats, sugars or glucose, green vegetables, salads and raw and cooked fruits. For the nursing mother, to this dietary should be added sodium bicarbonate by the mouth. In the treatment of acidosis we try to neutralize the acid intoxication, alleviate its symptoms, remove existing causes and contributory factors as much as possible, and also to empty the intestines.

The mild cases usually yield easily to treatment, but the severer cases are hard to handle. The average duration of the fatal cases seems to be about 32 hours. When the cyclic vomiting has ceased young children or infants should be placed upon a low diet, low in fats, in protein and in sugars, but not a fat free diet. Such foods may be skimmed milk, rice water, barley water, oatmeal water, but given for only a limited time, however. The juice of oranges, of pineapples, of grapes, as well as baked apples, apple sauce, prune sauce, pear sauce, and other sauces can be added ad-

vantageously to the diet. Gradually cereals, toast, gruels, broths and vegetable purées can also be given.

No drug to my knowledge wards off an attack. The younger the child the quicker sodium bicarbonate seems to take effect. Large amounts are seemingly well tolerated. For instance per rectum 3*i* of the bicarbonate to 3*ss* of boiled water or in very young children or in infants sod. bicarb. 3*ss* in 3*iii* of boiled water q. 2h. will give excellent results.

It is wise to thoroughly examine the patients as to adenoids, diseased tonsils and teeth, to faulty turbinate bones, and to an irregular septum of the nose. Also meteorism, a hard abdomen and intestinal fermentation or intoxication should excite special notice. If savages in the wild state have ever suffered from acidosis I have never heard of it. Acidosis goes hand in hand with civilization, with riches and poverty. It has often been remarked that many of our young patients live upon a normal and rational diet. It is not often that one sees a normal rational diet in the homes of our pampered nouveaux riche or generally in the homes of our very poor. There is too much cooked food of the starchy, fatty sort, it is too highly seasoned and often of little variety. On the other hand, among the poor we find the children, nursing mothers and many infants enjoying relatively the same bill of fare as does the hard working father, dish for dish. Savages eat the natural food of man often without cooking it, and as we step by step enter so-called civilization we leave behind us our primitive taste for the ideal diet—fruits, nuts, shoots and vegetables.

To offset acidosis we must also besides the fats, carbohydrates and proteins utilize the lime salts. Sohn says that while white,

brown breads and cereals are generally poor in lime, the casein of milk contains it. Fresh fruits and green vegetables contain the organic salts of potash, lime and soda. Now it is true that  $\frac{1}{2}$  a hundred weight of apples is needed to replace the protein of one pound of beefsteak, yet do we realize that 2 or 3 apples, for instance, supply enough of alkaline base to correct the acidity—after the organic acids have been oxidized away by metabolic processes—arising from the cereals ordinarily consumed in a day? A reference was made to natural man. It is well known that in the cooking of green vegetables half of their soluble salts are lost in the water in which they are cooked and which is thrown away. Again, some of the nitrogenous elements of the vegetables are unavailable through the inability of the human digestive ferments to penetrate the fibrous cells in which these nutrients are contained. Nevertheless after all this cooking and washing process the salts which are retained serve a very useful purpose in the treatment of acidosis. Uncooked fruits and vegetables contain digestive ferments (enzymes) which may possibly aid the ferments within us. Such enzymes are destroyed by cooking. Fruits, moreover, and I have pointed out this fact in previous articles, are often rather poor in protein but they contain sugars such as cane sugar, dextrose and levulose in great quantities, and as the ripening processes proceed in the fruits we find then the acid salts of potash, soda and lime. Levulose or fruit sugar is so delicate, so unirritating that it can be borne by the weakest stomach. This levulose or fruit sugar represents starch in the state of complete digestion and ready for instant absorption in the body. It is supposed to prevent the formation of acetone. The final stage of the digestion

of fruits is the conversion of fruit acids and salts into alkaline salts chiefly carbonates.

Vegetable foods are rich in alkalies and in phosphoric acid. These vegetable foods are in the form of organic salts ready to be transformed into carbonates within the body. The alkalies in the foods are those of potash and soda, the former playing an enormous part. "Potash," says Gautier, "alkalizes the tissues and owing to this combustions are brought about which tend to promote the oxidizing ferments." These potash salts are in the form of bicarbonate, tartrate and citrate. Brought to the tissues by the foods, these salts are transformed into carbonates and there arises the oxidization of their combustible part either in the cells or in the blood of herbivorous or omnivorous animals where they meet sodium chloride. They undergo with the latter a double decomposition resulting in the carbonate or bicarbonate of soda alkalinizing the plasma of the blood with the consequent elimination of chloride of potassium by the kidneys.

A fitting analogy to the loss of an alkali base through acidosis would seem to be an experiment by J. Loeb. He reduced the salt in the water where fishes were contained and their skins became white, with falling scales. The renewal of the salt brought them back to normality. It would seem then that in nature we have a preventative to acidosis and, except in very severe obstinate cases where artificial alkalies must be added to the body quickly and in large doses, a cure.

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**Chronic Diarrhea.**—Patients with chronic diarrhea should avoid drinking much at meals, as the fluid then excites reflex activity.—*Therapeutic Record.*

## DIET AS A MEANS OF COMBATING ACIDOSIS.

BY

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The pathological condition known as acidosis has been long known and been the subject of exhaustive researches by physiologists and clinicians, but the great importance of this disorder of metabolism as a factor in a great variety of medical and surgical cases is only just beginning to receive recognition. Many laboratory and clinical studies have demonstrated that the normal functioning of the body cells requires the maintenance of the reaction balance. The arterial blood must be kept neutral or slightly alkaline. Acids are toxic to all living cells either animal or vegetable. The neutrality of the blood is normally maintained by the removal of surplus acid radicals by the kidneys and by neutralization of the excess of acids by ammonia, which if not so used would be converted into urea. When for any reason this balancing mechanism breaks down, the alkaline reserve of the body is lost, alkali starvation results, all the nutritive functions become disordered and coma, even death, may supervene.

We now know that acidosis plays a dominant role in many conditions in which its presence was formerly not even suspected. The discovery of accurate tests for acidosis adapted to clinical work has greatly contributed to the collections of clinical data and the extension of our knowledge of acidosis. No hospital or public clinic can be regarded as properly equipped which is not provided with suitable means for recognizing disturbances of the reaction balance. Such an equipment is just as essential for

scientific medical work as is the thermometer or an outfit for examination of the urine.

Of the various tests for acidosis which have been suggested the most exact and practical appears to be the determination of the CO<sub>2</sub> tension in the alveolar air of the lungs. This method has been employed in our laboratory for several years; more than four thousand observations having been made, and comparison with other methods have shown it to be the most accurate and dependable. Other methods are also useful as checks.

It is not the purpose of this paper to discuss questions relating to technic, but rather to call attention to a few points of practical importance, especially in dealing with cases of chronic disease. First of all, it is important to know that acidosis or alkali starvation results from perverted metabolism. The direct cause of acidosis is the abnormal production in the liver of diacetic and beta-oxybutyric acids as a result of imperfect metabolism of fats and protein. Laboratory tests, it is true, have shown that acetone may be produced from carbohydrates in the test tube, but it has never been demonstrated that the ketone or acidosis bodies ever arise from carbohydrates in the human body. It is evident then, that from a therapeutic standpoint, the question of acidosis is of chief interest in relation to diet. All authorities now agree that the principal source of acidosis bodies is to be found in the fats. Acidosis appears immediately when the diet consists exclusively of fats and diminishes when food is entirely withdrawn. The acidosis bodies which appear in starvation are chiefly derived from the fats, since they diminish with the consumption of the fat reserve. It is also noticeable that acidosis is more marked in fat diabetics

who are made to fast than in those who are lean.

Zellner showed that the perfect oxidation of fats requires the simultaneous oxidation of carbohydrates. His experiments demonstrated that the proportions necessary for complete metabolism are one part by weight of carbohydrate to four of fat or one molecule of carbohydrate to three molecules of fatty acids, the equivalent of one calory of carbohydrate to nine calories of fat.

M. H. Fischer has shown that acidosis may result from the accumulation of phosphoric and sulphuric acids as the result of a high protein diet. It has long been known that the introduction of carbohydrates either by ingestion, by hypodermoclysis or by intravenous injection is a most efficient means of combating grave acidosis. It has also been clearly demonstrated by von Noorden and others that high protein feeding in diabetes increases the danger of acidosis and diabetic coma. Meat feeding in particular has been shown by numerous observers to encourage the tendency to acidosis.

A reasonable inference from these facts is that a diet largely made up of protein and fats strongly encourages acidosis, whereas a diet rich in carbohydrates has the opposite tendency. This deduction is entirely in harmony with the common experience of clinicians who generally recognize the necessity for restricting the intake of protein in cases of nephritis. The importance of this is still further emphasized by the observations of Palmer and Hendersen, who have shown that acidosis is generally present in nephritis. These observers found that in most cases of nephritis considerable quantities of bicarbonate of soda when administered by mouth fail to appear in the urine, being retained to make good the depleted

alkali reserve showing the existence of acidosis.

Lewis and Barkman have called attention to the fact that acidosis is present in the dyspnea observed in old persons with impaired renal functions. The presence of acidosis in exophthalmic goiter, and in pneumonia and other infectious diseases has been clearly established. It is evident then, that in the treatment of these conditions the protein ration should be reduced to a minimum and carbohydrates provided in abundance. Orange juice and other fruit juices are an excellent source of carbohydrates for use in these cases. Dilute lemonade sweetened with malt sugar is another convenient means of introducing carbohydrate. Malt sugar may be taken with meals in place of cane sugar or in lemonade or orange juice and at frequent intervals between meals. Malt sugar has the advantage that it is less sweet than cane sugar and is easily tolerated by the stomach and so it may be taken in large quantities.

In the treatment of cases of obesity examination of the patient with reference to acidosis is of great importance. When deprived of food, an obese person of course finds his chief source of energy in the oxidation of fat. In such a case the situation is practically the same as when a normal person is fed exclusively on fat. The few ounces of glycogen stored up in the liver and muscles is soon consumed, so after the first day or two of fasting the obese patient is living almost exclusively on fat and the natural result is a high degree of acidosis. The clinical evidence of acidosis is to be seen in the languor, weakness, lassitude, often headache and sometimes nausea of which obese patients often complain when fasting. By determination of the  $\text{CO}_2$  tension of the alveolar air the condition of

acidosis may be discovered before the unpleasant symptoms referred to make their appearance and thus failure may often be prevented for obese patients who have experienced the unpleasant effects of acidosis often prefer to endure the inconvenience of over-fatness rather than to suffer the distressing effects of acidosis.

By making daily tests it is possible to so regulate the carbohydrate intake of the obese patient as to avoid acidosis. The amount of carbohydrate may be easily determined by a simple calculation based upon the patient's base ration. The base ration may be approximately found by multiplying by 14 the patient's normal weight, that is, the normal weight for a person of his height. If the patient is taking a considerable amount of exercise the weight should be multiplied by 18. Suppose then the patient's ration is found to be 1,800 calories, divided by 9, the ration found by Zellner, we have 200 calories, equivalent to 50 grams of carbohydrates. If this small amount of carbohydrate is given to a patient who is taking a fasting cure for obesity acidosis will disappear. This amount of carbohydrate may be supplied by fourteen ounces of orange juice or eight ounces of grape juice, or two and one-half ounces of bread. The patient will lose flesh less rapidly but will avoid the disagreeable symptoms which tend to discourage him and lead him to abandon the effort. A still more satisfactory plan is to allow the obese patient to eat freely of such green vegetables as celery, lettuce, turnips, spinach, and green of all sorts and of such fruits as apples, strawberries, oranges, cantaloupe, and watermelons. Such a diet will not only satisfy the craving for food but will also furnish a liberal supply of basic elements to

neutralize the acids resulting from the oxidation of fats.

From the standpoint of our modern knowledge of acidosis the once famous Bauning method of treating obesity in which the patient was given a diet consisting almost exclusively of lean meats and was restricted to the smallest possible quantity of water must be regarded as wholly unscientific. An abundance of water is needed to wash away the products of tissue disintegration and especially to aid the kidneys in eliminating acid radicles.

A high protein intake, especially heavy meat feeding must certainly encourage the natural tendency to acidosis and thus do harm. Von Noorden long ago pointed out the disadvantages of high protein feeding in diabetes and especially called attention to the injurious effects of meat. Several years ago, Falta, von Noorden's able associate, remarked to the writer, "We find that much meat is very bad for diabetics."

In the practical management of the diet of several hundred cases of diabetes the writer and his colleagues have found great advantage in very largely replacing animal proteins by vegetable proteins. It is very surprising how quickly both acidosis and glycosuria disappear on a properly regulated diet in which the protein is reduced to a minimum and animal proteins most excluded.

More than 20 years ago the late Dujardin Beaumetz, at that time one of the leading internists of France, called attention to the fact that the detoxicating function of the liver depended upon its store of glycogen. This led the writer to adopt special carbohydrate feeding as a part of the preoperative and post-operative treatment of surgical cases. A little later I adopted as a routine plan, the introducing into the colon before

and after operation, of liberal quantities of malt sugar. For the last four years this plan of saturating the body with carbohydrates has been carried out systematically in operative cases. The result has been that instead of getting acidosis in 30 to 60 per cent. of all cases the number of cases of acidosis has been reduced to three per cent., and this has been accomplished without the use of alkalies. Bicarbonate of soda has been rarely used and has contributed little if anything to the results obtained. It might be added also that in surgical cases the old practice of purging and starving the patient before operation has been abandoned. This has also been found an advantage.

Bunge many years ago called attention to the fact that the ordinary diet among civilized nations tends to produce a preponderance of acids in the body. He especially called attention to the fact that flesh foods contain an excess of acids that are not oxidizable in the body (sulphuric and phosphoric) and that a considerable excess of these acids is also found in cereals.

Sherman of Columbia University, who has made extended studies of this subject in recent years, has fully confirmed the observations of Bunge. His tables show that while meat contains a very large excess of acids, cereals contain nearly a third as much as flesh meats, so that persons whose diet consists chiefly of meats of various sorts, bread and breakfast foods, are constantly closely bordering on acidosis. In such persons a surgical operation, an attack of pneumonia or some other infection or an acute sickness involving the loss of appetite and abstinence from food will naturally lead to the speedy development of a state of acidosis. It is also evident that under such a regimen the kidneys must be enormously overworked and exposed continually to the

harmful influence of a concentrated and highly acid urine, the relation of which to nephritis has been pointed out by Fischer.

Green vegetables, potatoes, and fruits, as pointed out by Bunge and also by Sherman, are rich in bases, which in these foodstuffs largely predominate over acids.

Hindhede showed that the urine of a person living on a potato diet is capable of dissolving 40 or 50 times as much uric acid as that of a person taking an ordinary mixed diet. He in fact observed that in quite a large proportion of cases the urine of persons living upon a mixed diet is supersaturated with uric acid so that the addition of a small amount of uric acid caused the precipitation of a larger amount.

Blatherwick, by an extended series of studies conducted in our laboratory, the results of which he has already published, fully confirmed the observations of Bunge, Sherman and Hindhede, and extended our knowledge of the influence of diet upon the reaction of the tissue fluids.

Rittenhouse, Fisk and others have called attention to the fact that within the last 30 years the death rate from chronic disease has doubled in this country. The mortality from disease of the heart and blood vessels and disease of the kidneys has much more than doubled within a single generation. The close relation of these diseases to acidosis points very directly to the prevailing diet of the American people as being at least one of the factors to which this enormous increase in mortality is due and emphasizes the importance of inculcating the necessity for a lowered intake of protein in the daily ration.

Chittenden's experiments show clearly that the protein intake need not constitute more than ten per cent. of the total ration. Numerous observers have shown that the

body does not actually require more than four or five grams of nitrogen daily, that is, an equivalent to 25 to 30 grams of protein. The average adult American takes from three to five times this amount of protein, thus loading his tissues with an enormous amount of unuseable material which must be eliminated at the cost of kidney impairment and premature senility.

The injury resulting from this excessive intake of protein is greatly increased by the sedentary habits of a large proportion of the population and especially from a diet deficient in bulk because of the use of fine flour bread and other concentrated foods from which cellulose, an essential intestinal stimulant, is almost wholly lacking.

Human beings are primates and as such are low protein feeders. Both the alimentary canal and the whole vital machinery upon which the functions of metabolism depend are in man and the anthropoids adapted to a carbonaceous rather than a nitrogenous dietary. The alimentary canal is long—ten times that of the length of the body, measuring from the end of the nose to the end of the back bone. The liver is small, only one-fourth as large in proportion to the body weight as in the dog and other carnivorous animals. In adopting a highly nitrogenous dietary to which we are constitutionally not adapted, we naturally must suffer the penalty which is always involved in a departure from the path of biologic rectitude.

Modern scientific research is showing more and more clearly that in these departures from primitive conditions of life is to be found the foundation of most of the chronic ills which afflict us.

**For Bee Stings.**—To relieve a bee sting reduce ammonia one-half and apply to the bite.

Conducted under the Editorial Direction of Dr. J. W. Wainwright.

**Arsenic—Its Effect upon the Kidney.—** Pearce and Brown, (*Journal of Experimental Medicine*, November, 1915), report results of their chemopathological studies with compounds of arsenic. They found that each compound of arsenic tested tended to produce a lesion complex in the kidney relatively characteristic for that compound. Some arsenicals produce changes in which vascular injury predominates, others produce an equally dominant tubular injury. In a similar way adrenal injury seems to be an important factor in arsenical intoxication. The character and severity of the injury produced by the different arsenicals varies with the chemical constitution of the compounds.

**Sugar in Infected Wounds.—** Fackenheim, (*Munch Med. Wochenschrift*, July 20, 1915), writes in favor of the use of powdered sugar on suppurating wounds. His technic is to cover the surface of the wound with granulated sugar; over this is placed a light dressing. He has used this in a very large series of cases and never noted contraindications, idiosyncrasies or reactions. The wound cleans up more rapidly; healthy granulations grow more evenly; while it acts as a powerful stimulant to epithelium growth.

**Chloral in the Treatment of Tetanus.—** Oppenheimer (*International Journal of Surgery*, December, 1915) states that chloral has given himself and associates most encouraging results; 10 to 15 grains well diluted, by mouth, to children between five and ten years of age every three to six hours according to severity of symptoms;

30 to 90 grains to older children and adults, according to age and symptoms. Repeat every four to six hours the first day or two. Then diminish doses and lengthen intervals gradually. If the convulsions are not checked in one to two hours repeat half the dose. If the patient cannot swallow give the chloral in 50 per cent larger doses by low enema in four ounces of warm normal saline solution, and repeat every four to six hours as indicated.

**Emetine in Pyorrhea.—** In the *United States Naval Medical Bulletin* (July, 1915) Allen concludes that emetine in conjunction with local measures afforded him beneficial effects in 77 per cent. of the cases treated, although an actual cure was obtained in only 35 per cent. This, he declares, does not coincide with the reports of some enthusiastic authors, yet does indicate that in emetine we have a valuable agent in the treatment of pyorrhea.

**Glucose Solution as a Prophylactic in Shock.—** In the *American Journal of the Medical Sciences* (September, 1915), it is stated by Burnham that sugar in the form of glucose solutions, supplies energy to the cells and aids in tissue repair; it diminishes acidosis and thus tends to remove one of the factors in the cause of postoperative vomiting; it neutralizes certain poisons in the circulation—the conjugate glycuronates is the best example of this action; and it is possible that it acts as a direct cardiac stimulant and food. In addition to this, the solution has many of the advantages and few of the disadvantages of saline solution. Only

a small percentage of the glucose injected hypodermically finds its way into the urine—usually from 2 to 5 per cent. The remainder, as has been proved by calorimetric experiments, is burned in the body, causing increase of heat formation and corresponding increase in the respiratory quotient.

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**Trichlorbutyl-Malonic Ester for Cough.**—Ernst Meyer (*Berliner Klin. Wochenschrift*, August 16, 1915) declares that pharmacological experiments have shown that this agent is harmless in large doses when given to rabbits; that it causes a general diminution in reflex excitability, and does not depress bloodpressure. Meyer made use of the agent in marked and persistent cough. He used the ammonium salt on account of a greater solubility and absence of disagreeable taste. From 0.5 to 0.6 gram was given daily in single doses from 0.1 to 0.2 gram. In some instances double the maximum dose was given per day. In the greater number of cases treated there was prompt relief from cough; in some cases the larger dose was needed. It is specially indicated in pulmonary tuberculosis with hemoptysis in small amounts. It at once checked the bleeding, when other agents had failed.

This treatment not only promotes tissue drainage, but increases oxidation, activates phagocytosis, produces diuresis, relieves dyspnea and dissipates lividity. A notable increase in urine and excreta from the intestines results in the succeeding twenty-four hours. Where there is suppressed or inadequate elimination, the quantity of solids in the urine will be found greatly increased.

This treatment may be applied several times weekly, and is recommended by the author in uremic or diabetic coma, pulmonary or portal engorgement, nervous fatigue and gastroenterogenous toxemia.

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**The Oven Bath as an Eliminant.**—B. S. Price (*American Journal of Electrotherapeutics and Radiology*, January, 1916) writes concerning the oven bath as an accelerator of tissue drainage in various conditions in which accumulations of injurious waste substances take place. The material required is an oven table or cabinet, a bath tub, a table for subsequent massage and Turkish bath sheets and towels. The patient's digestion should be well advanced before beginning the bath. He should be covered by a Turkish bath robe and a couple of bath sheets with some additional protection for the hands and feet. The head should be incased in an ice pack. The temperature of the air in the oven is quickly raised to 500° F., the air being always kept dry, and maintained thus until the patient's temporal pulse becomes full, regular, elastic and soft, when it will be found that the

**Quinine and Urea in the Toxemia of Pulmonary Tuberculosis.**—According to Myer Solis Cohen (*New York Medical Journal*, February 26, 1916) this product is of inestimable value in combating toxemias including the toxemia of pulmonary tuberculosis. It has, he declares, been used empirically in the treatment of pneumonia with signal success by numerous clinicians. In pneumonia it brought about an early crisis, controlled the toxemia which latter seemed to diminish as the temperature declined.

The author has employed quinine and urea in the toxemias of infections other than pneumonia and tuberculosis with seemingly good results. In reducing septic tem-

perature in advanced pulmonary tuberculosis the author gives credit of first reports to Solomon Solis Cohen. This elevated temperature is very difficult to control. In very many cases quinine and urea hydrochloride will cause a reduction of temperature and amelioration of other toxic symptoms. It is not however, a specific, for all patients do not respond favorably, nor does the same patient at all times.

The author gives the preparation in capsules; does not approve of its use intermuscularly or subcutaneously. The dose is from five to ten grains. In some cases fifteen grains may be given, while in susceptible individuals two to three grains will be sufficient. It may be given once a day, or at intervals of three to four hours, dependent upon the effect produced. It is to be reduced as the fever declines and at the appearance of cinchonism.

or flaxseed is recommended, one or two ounces stewed in soup or with fruit. The flaxseeds must not be chewed, but swallowed whole. Their content of mucilage makes the feces more bulky and slippery and thus facilitate comfortable movements of the bowels. The flaxseeds never cause irritation.

**Chloramine in the Treatment of Wounds of the Mouth and Jaws.**—A. R. Fisher, (*British Medical Journal*, January 15, 1916), reports upon the septic character of gunshot wounds involving the mouth and the unsatisfactory use of ordinary antiseptics. He used chloramine (toluene sodium sulphochloramide) in seven cases, five being compound fractures of the jaw and two flesh wounds involving the mouth. A two per cent aqueous solution was used for irrigation, carried out hourly during the day and as often as possible through the night. Chloramine is a powerful anti-septic, penetrates the tissues, is not readily neutralized by albuminous discharges, is bland and nonirritating. Results were most encouraging.

**Cresatine in Gonorrhreal Ophthalmia.**—Barnet (*Medical Record*, February 5, 1916) states that he has found in cresatine (metacresol-acetic acid-ester) a synthetic phenol derivative, a specific in gonorrhreal ophthalmia. One application of the pure cresatine on a cotton swab to the cocainized cornea and conjunctiva usually gives marked and speedy relief of symptoms and the disappearance of the gonococci. A second application is sometimes necessary, but a third rarely so. A twenty-five per cent solution in liquid petrolatum is an efficient prophylactic. This treatment limits the duration of the ophthalmia to twenty-four or forty-eight hours after the first application. Cresatine is absolutely non-injurious to the tissue cells of the cornea or conjunctiva.

**The Electrolytic Bath in the Treatment of Septic Wounds.**—Frank Fowler, (*British Medical Journal*, September 18, 1915), writes that Russ has shown that practically all bacteria are attracted to the positive pole when a small electrical current is passed through a solution of sodium chloride. The small current required was also fatal to the germs without the aid of ionized agents and produced no injury to the tissues. On the contrary, the current has a beneficial effect on the tissues, stimulating formation of granulations and the growth of epithelium. The apparatus required is a battery of twenty to thirty cells, a current collector and a millimeter. The wound should be immersed in warm solution of salt (sodium chloride) and the positive electrode placed in the bath. The negative pole should be applied to an indifferent portion of the body and the current slowly introduced and gradually raised to twenty or thirty milliamperes. The treatments should last for at least half an hour and be given daily. This method of treatment of septic wounds yields most excellent results.

**Linseed in Treatment of Chronic Constipation.**—Kohnstamm and Openheimer, (*Therapie der Gegenwart*, September, 1915), express their belief that chronic constipation is due to autointoxication with the products of meat digestion. Their patients are put on a lactovegetable diet, being forbidden to eat even small amounts of meat, fish or fowl, but permitted meat soups and meat extracts. Milk is given freely, part at least as buttermilk. In addition linseed

### The Thyroid During Pregnancy.—

Every observant physician has noticed that during pregnancy the thyroid gland is very often considerably enlarged. It is now well understood that a certain degree of increase in the activity of this important organ is normal during gestation. It is not difficult to imagine conditions which under normal circumstances stimulate this gland, becoming sufficiently marked to cause an excessive physiologic activity, or, on the other hand, to antagonize the work of the thyroid and cause a progressive hypothyroidism. Both of these conditions may occur in pregnancy, the former being the less frequent but most marked in its manifestations; while the latter is very common and the manifestations are of such a nature as to be overlooked in most cases.

In the majority of prospective mothers the enlargement of the thyroid gland is present without any unpleasant or noticeable symptoms. When these symptoms develop into irritability, tachycardia, palpitation, nausea and, later hyperemesis, the excessive action of the thyroid has reached a harmful stage, which need not have occurred had this prospective trouble been anticipated and steps taken to obviate its appearance. Undoubtedly this excessive thyroid action is due to stimulation by toxins from various foci in the mother, as well as the normal increase in humoral wastes coming from the placenta and the fetus. Occasionally there is a well-marked choriionic toxemia which has been differentiated from the less marked and "normal" toxemia from the metabolism of the intrauterine contents.

It cannot be too often emphasized that the principal function of the thyroid is one of detoxication and hence prophylactic treatment will be to ferret out and remove every form of local toxemia from tonsils, teeth and alimentary tract, as well as any

lurking infective focus elsewhere in the lungs, skin or other parts of the body. It is also well to remember that during pregnancy there is a tendency to acidosis or a reduction in the normal degree of blood alkalinity, which if unchecked may aggravate the trouble to which we are now referring. This is easily controlled by dietetic regulation and the judicious use of sodium bicarbonate.

Many times the stability of the thyroid gland and the endocrinous system as a whole is such that the natural conditions of pregnancy suffice to disorganize their important functions with serious results; or again the thyroid may be so persistently and thoroughly overworked by the continued toxemia that before long its cells become "tired out" and a condition of hypothyroidism obtains. It is well to remember that this may occur without any previous symptoms of thyroid excess or may supervene after a storm produced by the undue production of hormones brought about by the toxemia already referred to.

In the estimation of some the symptoms of thyroid inadequacy during pregnancy are more important than the more easily discerned hyperthyroidism, for while both conditions impress themselves more or less indelibly upon the delicate hormone-producing mechanism of the fetus, the results of the condition resulting from the thyroid gland succumbing to the undue strain put upon it, are responsible for the frequency of hereditary thyroid disorder and especially that condition called by Leopold Levi "*L'instabilité thyroidienne*"; a state in which the thyroid is unduly susceptible to the numerous influences which are brought to bear upon it during life, and especially in early life and puberty.

In a recent address, Sajous makes some extremely interesting remarks about the im-

portance of conserving the future generations by investigating the endocrinous economy of the mothers *during pregnancy* and modifying with suitable measures (including organotherapy) any conditions of this character that may show themselves however slightly. This is as important a phase of organotherapy as any we have yet considered, and reference will be made later to this important pronunciamento.

Many a young woman is suffering from this thyroid instability and, perhaps, has managed to pass through the endocrinous storms of growth and puberty with no very marked inconvenience; but with the stress of pregnancy a train of symptoms may appear which it is our business to discover and control. These symptoms vary in their incidence and intensity, but are none the less of vital importance both to mother and child. Elimination is always reduced, the skin is inactive and may be the seat of dermatoses of differing degree and importance, the urinary solids are materially lessened, the urea being frequently as low as  $\frac{1}{4}$  to  $\frac{1}{2}\%$  with a total of as little as 5 or 10 grams in 24 hours. The acidity in such cases is unduly high, reaching as much as 120 to 150 degrees, when the normal is about 40. Obviously this favors the onset of "toxic crises" and they are not uncommon. The nausea and vomiting with headache and malaise are in many cases the result of an overwhelmed thyroid with an associated reduction in all the metabolic processes of the body, for it must always be remembered that the thyroid is the key-stone of the metabolic structure and usually the first to bend under the strain imposed upon it.

Many times the relation of the thyroid to these metabolic dyscrasias is not noticed, and the expected hypothyroid manifestations are not discernible, while again the pulse may be unduly slow, the skin show a puffy swelling and the typical "thyroid infiltration" described by Hertoghe, is easy to be discerned. A myxedematous appearance is occasionally noticed, the skin becomes dry and rough and the eyelids swell. This last symptom, by the way, often may be the only direct evidence of infiltration and frequently has been charged to failing kidneys, for in cases with excessive acidity of the urine it has been shown that casts are not uncommon as well as marked traces of albumen. The mental status may be altered

and other well marked symptoms of a failing thyroid may show themselves. Subjective sensations of cold, out of all proportion to the temperature or clothing, with chilly sensations in the back and limbs and cold extremities are frequently the earliest evidence of a failing thyroid.

Whether these well-defined symptoms of hypothyroidism are present or not, it is reasonable to presume that the continued subnormal elimination of wastes in the urine, and the nausea and vomiting are sufficiently definite indications of impending thyroid disorder, and in such cases thyroid therapy may be judiciously instituted with considerable hope of benefit. This may prevent a serious and permanent thyroid disorder as well as the more important influence upon the endocrinous stability of the child.

Several writers, notably Hertoghe, have noticed that eclampsia is found in these cases with thyroid insufficiency and the symptoms of the impending onset of this condition before term have been dissipated by thyroid therapy.<sup>1</sup> This being the case it is all the more rational to use thyroid as a prophylactic, especially in those women who exhibit several of the earliest signs of thyroid insufficiency during pregnancy.

One or two grains of a thoroughly dependable preparation (corresponding to about one-fifth this amount of the U. S. P. desiccated thyroids) in divided dosage is usually sufficient. Some cases require more, in any event five grains a day for a few days, especially when the nausea and vomiting is distressing, is quite enough. This should be continued for alternate intervals of two or three weeks, with similar periods of abstinence. There is an advantage in an occasional course of thyroid medication, and it is not all evident in the mother either. Another method of dosage is to divide 15 or 20 grains of thyroid into 14 to 21 doses and give for one week, omitting for two weeks or even three and continuing the same dosage at similar intervals throughout pregnancy. Each patient is a law unto herself. The capacity of the thyroid in different individuals varies as does the susceptibility to toxemia and to

<sup>1</sup> This does not mean that eclampsia is best treated in this manner; but that where there is a well marked toxemia with poor elimination and conditions which are expected to terminate in eclampsia, thyroid therapy is rational and useful.

thyroid medication, hence no hard and fast rule can be laid down.

Buttermilk in liberal amounts often is a useful remedy in these cases.

Suffice it to say that many cases of ductless glandular trouble in mothers (and child) date from pregnancy, and practically all of them have resulted from an untreated thyroid insufficiency; hence the importance of considering the activities of the thyroid during gestation, and the augmentation of its waning powers with suitable organotherapy when it is necessary.

### **Acidosis and the Thyroid Gland.—**

While numerous factors are obviously concerned with the production in the body of acidosis, acidemia or systemic hypoalkalinity, there is one which deserves a little more attention than is usually given to it.

The thyroid gland regulates tissue metabolism. It is also among the most important detoxicating agencies in the body. Cell chemistry is under the direct control of a hormone produced in the thyroid gland; and the experimental work of Kendall and his associates at the Mayo Clinic with the recently isolated active principle of the thyroid, called "alpha-iodine," not only has proved the contentions of many years regarding the physiological activities of the thyroid gland, but also indicates that the function of this hormone is especially concerned with the metabolism of the amino-acids.<sup>1</sup>

As will doubtless have been fully explained elsewhere in this special issue of AMERICAN MEDICINE, the chief causative element in systemic hypoalkalinity is not so much a defective metabolism of the acid products of cell chemistry, as an over production of these toxins; and, naturally, the successful treatment of this condition involves first and foremost the removal of as many as possible of the conditions which favor the production of acid wastes and, simultaneously, the administration of suitable alkali-bearing foods and drugs.

Besides this, however, an appreciation of the rôle of the thyroid hormone will enable us to treat many individual cases of acidosis, especially the chronic and protracted forms, with much greater success. It must be remembered that the toxemia of acidosis affects the cells of the thyroid gland just as it affects any other cells in the body. In so doing a vicious circle is formed which still further reduces the cellular activities of the body, including those of the thyroid itself.

The more or less well marked thyroid insufficiency, then, is a factor of no small significance in acidosis, as those know well who appreciate the all-important service of the thyroid to the body as a whole, and who also know when and how to augment the decreased powers of this gland.

Just a year ago in the Special Rheumatism Number of AMERICAN MEDICINE (June, 1915, xxi, p. 363) there were presented a number of reports which strongly suggested a thyroid element in rheumatism and the rheumatic diathesis. These facts apply with equal force in a consideration of the relation of the thyroid to acidosis, for this is one of the most common and constant symptoms of rheumatism.

Those who have read some of the numerous French communications on the thyroid gland and its dyscrasias, have noted how frequently acidosis or allied conditions are mentioned. These remarks include coma due to well advanced myxedema (Hertoghe. *Du coma myxedémateux. Bull. Acad. roy. Méd. Belg.*, Feb. 25, 1911) on the one hand, and the slight and usually overlooked metabolic sluggishness of minor thyroid insufficiency, on the other. In each extreme there is a deficient action on the part of the thyroid with a varying reduction in the alkaline elements in the blood and tissue juices, depending, in a measure at least, upon the work of this gland. In these extremes, as well as in all the shades of thyroid inactivity in between, when other evidences of hypothyroidism are found, suitable doses of thyroid gland (say  $\frac{1}{4}$  to  $\frac{1}{2}$  a grain three or four times a day, for several weeks) will render a well defined and useful adjuvant service, and favor the re-establishment of the endocrinous balance which has been disorganized by the acidosis and which, at the same time as has just been explained, is adding to the degree of alkali deprivation.

<sup>1</sup> This is in harmony with the exhaustive studies of Slosse, of Brussels, who in 1913 (*Une nouvelle fonction thyroïdienne. Bull. Acad. roy. Méd. Belg.*, 1913, xxvii, p. 697) performed numerous experiments which indicated that the thyroid gland produces what was then termed a "deaminizing hormone" which specifically influences the course of protein metabolism.

**Stop Fly Breeding.**—*The Virginia Health Bulletin* (April, 1916) makes a practical appeal for one phase of health insurance of the real kind. It presents a pure business proposition. The entire basis is summed up in two sentences. "Your health insurance is to come by making that well (or spring) and that privy safe. The price is the time it will take to do these things."

The purpose of the campaign is to protect the privy from flies and the water supply from the privy. The protection of a water supply is vitally important. The elimination of the privy or the installation of a sanitary privy is imperative. It is a splendid form of health insurance that fights against the transmission of disease by flies.

Sweet (*Public Health Report*, April 14, 1916) points out that of the natural enemies of man, the fly unquestionably takes precedence over all others. Summer is at hand. The house fly, the blow fly, and the stable fly, with all their friends and relatives, are buzzing with excitement. With ample opportunities for breeding in manure piles, kitchen refuse, putrescent foods, and human excreta, propagation is rapid.

The millions of flies developing in the filth during the hot weather are spreading contamination in various ways leaving a trail of disease and infection in the homes of men. The spots made by the flies, the regurgitations or fecal spots which serve to point out their number and activity are laden with infective material.

The mechanical transference of disease is the commonest form of conveying infection from polluted sources to foods and drink; thus typhoid fever, diarrhea, cholera, dysen-

tery, paratyphoid are conveyed to man. Some of the biting flies directly inoculate their human victims with pathogenic organisms or parasites, and there arise, for example, infantile paralysis, sleeping sickness and similar infections. While the agency of flies in the transmission of typhoid fever has been recognized for almost twenty years, American communities still permit themselves to suffer because of their inactivity, particularly with relation to the privies which are so numerous throughout the United States.

The "swat the fly" campaign has endeavored to supplement the activities of the natural enemies of the flies, such as lizards, toads and spiders but the sum total of the efforts of these natural and artificial devices has been unable to satisfactorily attack the problem. The sporadic fly-swatting campaign is useless, save possibly for keeping one's individual home more or less free from obnoxious insects. Cleanliness of the home is of paramount importance and when properly secured relegates swatting to a very minor place in the household occupations.

The eradication of flies demands attention during the entire year with the stressing of efforts during the early breeding season, March, April, and May. The later the efforts are postponed the less effective are the results. The campaign against flies is a monumental sanitary procedure. It aims to eliminate all fly breeding areas. This demands a high standard of community cleanliness with the prompt removal of garbage, refuse and rubbish, not mere removal to another place, but its proper disposal by deep burial or incineration.

The removal of horse manure, a favorite breeding place for flies, is patently essential. This is now possible by proper reception in closed or screened bins made of cement

and properly drained. In farming countries, the problem of manure disposal is more difficult, as accumulations of animal excreta can hardly be avoided. The Department of Agriculture estimates that if borax is used in an amount not to exceed one pound to every 16 cubic feet of manure, the development of eggs and larvae is inhibited. No damage to the land will result nor interference with the crop development if no more than 15 tons of the manure thus treated is applied to the acre.

Inasmuch as out-houses are particularly dangerous because of the possibility of the spread of disease from the contamination of the fly and later the pollution of food, the screening of privies and the making of them fly-proof is fundamental. With the widespread interest in military camps, it becomes necessary to apply these principles to the protection of latrines, in order to safeguard the citizen soldiers from unnecessary infection.

While it may be too late at this time to secure the maximum results from a sanitary campaign against flydom, the "swat the fly" idea should not be permitted to blunt our senses to its weaknesses. The fly-killing campaign must be directed into sanitary channels and the strength and vigor and force expended by individuals may be more effectively used if diverted to more effective and more permanent communal improvements. The real slogan of the fly-killing campaigns should be "stop fly breeding" and then swatting will pass into disfavor or at least be recognized as of subsidiary importance in the campaign to free human beings from the disease and pestilences which are borne by their winged enemies.

**Sanitation in the Country.**—It is a popular tradition, says Edward D. Rich in a recent issue of *Public Health* that the



country is a more healthy place in which to live than the city. This idea, the author continues, doubtless has its root in the fact that country air is less polluted with smoke, dust and the gaseous products of commercial industries.

It is true, of course, that the effects of bad air on the general tone of the human

system is harmful, but its dangers when compared with other insanitary conditions and in view of what we know concerning the modes of transmission of the more dangerous communicable diseases is frequently much overestimated. Dark and ill ventilated rooms, particularly those used for sleeping, play a much more important part in the spread of the respiratory diseases than does a badly polluted outside air.

There was a time when the importance of a generous supply of fresh air, especially at night, was given so little consideration in the country as to occasion the remark that "No wonder the country air is pure, the farmers keep all the bad air shut up in their bedrooms."

In these days of publicity, the wide-awake farmer is giving intelligent study to the problems of sanitation and demanding a very much higher degree of safety, comfort and convenience in his surroundings and doing much to abolish the cause for any such remarks as that quoted above.

"The so-called 'water-borne' diseases are those against which preventive measures are most readily applied by the sanitary engineer. It must be clearly borne in mind, with respect to the water-borne diseases, that, in order to produce an infection, the specific germs of the disease must find their way from the bowel and kidney discharges of the invalid into the digestive tract of a well person by way of his mouth. This generally occurs through the medium of food or drink, particularly water; hence the name 'water-borne.' When we reflect upon this we are at once impressed with the importance of using great care in protecting food and drink supplies from contamination existing in any discharges from the human body, notably that contained in privy vaults, cesspools and sewers. It would seem that the chief danger to health in rural communities lies in the neglect of taking proper precaution in the disposal of sewage and night soil. The open privy with its attendant evils is still common in the country districts of Michigan and altogether too prevalent in many of our cities where sewerage facilities are available. There is no excuse for its existence and it must be abolished before we can lay claim to any degree of decency and progressive sanitation.

If one cannot afford expensive toilet conveniences, a privy which is safe, decent, re-

spectable and sanitary may be had in place of the one so commonly used and to which none of the above objections could, by any stretch of imagination, be applied.

Three requirements should be complied with if the privy is to be first-class:

1. The receptacle must be water-tight and easily cleaned.

2. The building must be fly-tight and well ventilated.

3. Care and attention must be given to regular cleaning and it must not be allowed to get out of repair.

Water-tightness means either a concrete vault or a removable receptacle placed above the surface of the ground. The latter is preferable on account of the ease of cleaning and, if plenty of dry earth is used, need not require frequent renewals.

Fly-tightness demands screens in the windows, self-closing lids and doors and all the parts fitted together in a workmanlike manner and maintained in that condition. Ventilation may be obtained through screened windows or through a pipe or box flue extending through the roof.

Regular cleaning should be made once each week in summer and about once in three weeks during the winter.

If the above precautions are observed the soil can be protected from pollution, and the depredations of flies, which play such an important part in carrying disease germs to the kitchen, very largely prevented."

Finally, as Rich well says: "The importance of disposal of night-soil and sewage on the farm cannot be over-estimated with respect to the possibility of danger to well water supplies from soil pollution. It is not generally known that the earth has very little purifying power at depths greater than two or three feet and so cannot be relied upon to counteract the effects of cess-pool or privy vault seepage which commonly finds its way into the ground at depths of from three to ten feet. Just how far such pollution will travel under ground depends upon the earth formation in a given locality, but is often several hundred feet." The menace to near by wells or springs needs no comment. From the foregoing the seriousness of the problem of rural sanitation will be evident and no one who is familiar with conditions in the country and on the average farm can deny that a vast amount of

education on sanitary matters is needed. Marked improvement has been made but much remains to be done before the country can justify its claim of being healthier than the city.

**War.**—While to most of us in America the great struggle now going on in Europe is fraught with horror, there is still a sense of vagueness, an unreality if we may thus describe it, which makes the whole great holocaust seem little more than some intensely interesting but altogether horrible story. The years of peace, that to the average person have typified the normal state of society, that have dominated our mental processes and given to our mind-pictures their gentle, homely character, have failed to qualify us to think in terms of war and its consequences. This is why the awful scenes that have followed each other with almost kaleidoscopic rapidity in the war zones are so difficult for many of us to reproduce in our mind's eye with all their terrifying details. Numerous writers with varying degrees of success have attempted to depict the awfulness of modern warfare, but it has remained for Edward D. Toland in his book *The Aftermath of War* (The Macmillan Co.) to give us a series of pen pictures that are so real and clear cut in their portrayal of certain consequences of war that they are almost cinematographic. Toland is a young Princeton graduate who felt the call of adventure when the great war broke out. Opportunity presenting itself he straightway left for the other side of the Atlantic, and his book is a faithful record of his experiences. It is evident that the author had very little knowledge of surgery previous to his work in the Parisian hospitals or ambulances, and it is his naïve descriptions of passing events that makes his book so intensely interesting. One almost lives with the author the various experi-

ences he passes through. Thus he describes an early episode:—

One of the first we attended to, had a shrapnel bullet through his shoulder. There was no wound of exit, and, just as J. was starting to bandage him up for evacuation he said, "Hello, here is the bullet, right here." He put my finger on a spot on the man's arm. There was an imperceptible little bump, but he said that it was the bullet, and very close under the skin, too. "I'll get that out right now," he said, and took his knife and, without giving the man either a local or general anesthetic, made a two-inch incision.

"Oh, la, la," shouted the blackamoor, "mais qu'est-ce que tu fais?"

"Restez tranquill, Monsieur; je vais oter la balle," replied Joll, with a grand gesture and magnificent accent.

"C'est bien," he answered, "allez donc."

Joll cut a little more, put in a probe and out came the ball—a couple of stitches, and it was all over in certainly less than twenty seconds. These fellows have good nerve; the man never budged after the first start.

Not all the experiences of the author were sordid and depressing and more than one touch of humor enlivens his pages.

These French territorial sentries are a dumb lot; when I was at Montdidier, an officious old boy, who had evidently just been put on, halted me. I gave him the "Mot," but he had to see my "Carte d'identite" too. He scowled at the photograph, scowled at me; looked back and forth comparing my face with that of the photograph and at last said suspiciously:

"You were younger when that was taken?"

"No, sir," I replied, "I was older."

"Bien passez!" he grunted.

The story of his return to a hospital from which he was transferred is especially moving and one can appreciate his gladness at the progress toward recovery made by some of the desperately wounded cases he had helped to care for when at their worst.

Two head cases were up and walking about the wards, and another man was pushing a chair. He spoke to me and I did not know him. It was the French soldier with the broken shoulder and the two bayonet wounds in the stomach that were discharging fecal matter,—now entirely well. Tears came into my eyes as I shook his hand, I hadn't expected ever to see him alive again. The little English boy with the perforating wound of the left thorax had put on ten pounds and waved at me from across the room, as if he had never known what it was to be sick. Every other bed had a new face on it, and the men who had been there when I left, had got well and had been sent home.

The last man I saw was the English Captain Seabrooke with the terrible leg, that I helped dress every day for two weeks. Joll said I would be surprised when I saw him; but I was hardly prepared for the rosy-cheeked, splendid looking

fellow in the bed I had bent over so many times. He too had put on at least ten pounds. A lump came in my throat and I could hardly speak to him. The wound that they used to take a basin full of stuffing out of, is now only two inches long on each side. His wife was there, and she is going to take him back to England in a couple of weeks to walk again, within six months.

It was a very impressive hour. There in front of the eyes of those men and women were the tangible results of the work that they had been faithfully doing, day and night for two months past; the realization of their training and toil. Suffering alleviated, hearts gladdened, and limbs and lives saved. Can there be greater satisfaction in any vocation?

Simple and free from all affectation or attempt at literary fervor, Toland's book is nevertheless a human document that will give a much more accurate and comprehensive conception of what war can do to men's bodies without killing them outright, than many a more pretentious and elaborate volume.

**Anesthesia.**—The notable progress that has been made during the last decade in the efficient use of anesthetics and the remarkable influence anesthesia has had in bringing surgery to its present position, naturally assure any comprehensive book on the subject more than passing attention and interest. Flagg's *Art of Anesthesia* (J. B. Lippincott Co., Philadelphia. Price, \$3.00) is a work that is sure of a reception, which will grow in warmth and appreciation as the genuine worth and importance of the book are noted. Flagg has given the profession a work that admits of no doubt as to his thorough knowledge of the subject. Practical and scientific in its consideration of the various phases of the question, the book is written in a particularly happy style, so that although a remarkably complete and scholarly exposition of anesthesia, it is one of the most readable and interesting discussions of a scientific topic that has been issued for many a day. In referring to the origin of anesthesia the author says:

The beginning of the use of anesthesia is not known; it dates from the earliest antiquity. The following commonly accepted references prove that narcotics were used in pre-anesthetic times.

Homer, in "The Odyssey," says: "Helen dropped into the wine of which (the soldiers) drank a drug, an antidote of grief and pain inducing oblivion to all ills. He who drinks of this mingled cup sheds not a tear the livelong

day were death to seize his venerated sire or her who gave him birth, or were the sword buried in the bosom of his brother or greatly loved sister, no tear would even then bedew his cheeks."

In 484 B. C., Herodotus refers to the inhalation of the vapors of hemp (*Cannabis Indica*) to produce intoxication.

In 23 A. D., Pliny, the Roman author, speaks of the juice of certain leaves taken before cuttings and burning to produce sleep.

In 134 A. D., Galen, the physician, speaks of the power of mandragora to paralyze sensation and motion.

In 250 A. D., Lucian, the Greek historian, refers to the narcotic effects of mandragora.

In 1250, Hugo de Luca, physician, refers to a certain oil with which he put patients to sleep before operations.

In 1544 Du Bartas implies a custom by writing:

Even as a surgeon, minding off to cut  
Some cureless limb, before in use he put  
His violent engines on the vicious member  
Bringeth his patient in a senseless slumber.

In 1613, Shakespeare in "Cymbeline," Act 1, Scene VI, implies the use of a narcotic. (Cornelius plans to give a secret drug which)

Will stupify and dull the sense awhile,

No danger in what show of death it makes.

In 1772, Priestly discovers nitrous oxide.

In 1804, Sir Humphrey Davy suggests the use of nitrous oxide as an anesthetic.

In 1818, Faraday notes resemblance between nitrous oxide and ether.

The narcotic effects secured in ancient, mediaeval and modern times, during the period which we have designated as pre-anesthetic (previous to 1842) were brought about chiefly by the use of:

Mandragora root (related to belladonna).

*Cannabis indica*, a certain kind of hemp, smoked as hashisch.

Secret Chinese mixtures.

Pressure on blood-vessels and nerve trunks.

Hypnotism.

The anesthetic period was foreshadowed by the sporadic use of nitrous oxide both in England and America. At about this time it became a common practice for persons to inhale the fumes of ether for the exhilarating effects. This practice sometimes formed the chief entertainment at country parties. These ether frolics probably suggested the use of this agent as an anesthetic for during these frolics, the stage of excitement occasionally led to unconsciousness and loss of sensation.

The author gives a particularly interesting description of the first operation under ether, performed by Dr. Warren in Boston and with Dr. Morton giving the anesthetic. He points out the epochal character of this event and says:

As the operator, Dr. Warren, remarked at the conclusion of the operation, "Gentlemen, this is no humbug," so subsequent events proved this public demonstration to be the birth of a new

era. The crudeness of pre-anesthetic methods is vividly depicted by Hayden, who describes an operation performed on a woman: "With a meek, imploring look and the air of a startled fawn, as her modest gaze meets the bold eyes fixed upon her, she is brought into the amphitheatre crowded with men anxious to see the shedding of her blood, and laid upon the table. With a knowledge and merciful regard as to the intensity of the agony which she is to suffer, opiates and stimulants have been freely given her which, perhaps at this last stage, are again repeated. She is cheered by kind words and the information that it will soon be over and she freed forever from what now afflicts her; she is enjoined to be calm and to keep quiet and still; and with assistance at hand to hold her struggling form, the operation is commenced.

But of what avail are all her attempts at fortitude! At the first clear, crisp cut of the scalpel, agonizing screams burst from her, and with convulsive efforts she endeavors to leap from the table; but force is nigh. Strong men throw themselves upon her and pinion her limbs. Shrieks upon shrieks make their horrible way into the stillness of the room, until the heart of the boldest sinks into his bosom like a lump of lead.

At length it is finished and, prostrate with pain, weak from her exertions and bruised by the violence used, she is borne from the amphitheatre to her bed in the wards, to recover from the shock by slow degrees."

These extracts will indicate to a slight extent the exceptional readability of this valuable book. It is profusely illustrated, excellently arranged and printed, and in every way a work that will stand for many a day as a credit to its author, and a source of pleasure and profit to the medical profession.

**Motherhood.**—Never was there more thought being given to the bearing healthy motherhood has on the welfare of the race than there is to-day. Whether this is due to a broader, more intelligent grasp of the possibilities that lie in maternal education and training, or to a broader interest in racial betterment, is hard to say. But there can be no doubt that the subject is receiving more attention than ever before and this promises much for the immediate future. Ferdinand Herb's *Beauty and Motherhood* (The Medico Press, Chicago) deserves special mention for here is a book that takes up the subject from an unusual angle and opens up a mine of thought that is rich indeed. Full of valuable ideas, and stimulating to a marked degree to every thinking person who

peruses it, this book should accomplish all that its author hopes for—and a great deal more. Many and various are the questions taken up and considered in plain commonplace language, but with a degree of common sense that will appeal to the thoughtful. Take, for example, the problem of undevelopment. According to the author:

Lack of development of the pelvic organs is by no means rare. While the percentage of aggravated cases is, fortunately, not very high, the number of those girls who have minor defects or show their physical inferiority through lack of feminine charms, or otherwise do not come up to the standard of a fully developed, normal woman, is very great. Keen observers of large experience have estimated it variously up to 25 per cent of all women. They can be found everywhere if one is able to recognize their characteristic marks; in the school, the factory, on the street, in society—in fact, wherever girls or women congregate.

After showing the frequency of imperfect physical development in young women, the author naturally points out the great importance of taking early and appropriate steps to overcome this condition and better fit our girls for motherhood by inaugurating suitable physical training. Other phases of these vital questions are carefully considered and discussed in the same earnest, sententious way. *Beauty and Motherhood* has a message for every woman, and medical men will do well to promote its delivery.

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**Civilization and Climate.**—The definition of civilization is always difficult. Ellsworth Huntington, in *Civilization and Climate* (Yale University Press) states:

I mean by this the power of initiative, the capacity for formulating new ideas and for carrying them into effect, the power of self-control, high standards of honesty and morality, the power to lead and to control other races, the capacity for disseminating ideas, and other similar qualities which will readily suggest themselves. These qualities find expression in high ideals, respect for law, inventiveness, ability to develop philosophical systems, stability and honesty of government, a highly developed system of education, the capacity to dominate the less civilized parts of the world, and the ability to carry out far-reaching enterprises covering long periods of time and great areas of the earth's surface.

With this definition in mind, the author seeks to show that man's development is in many ways dependent upon nature.

The climate of many countries seems to be one of the great reasons why idleness, dis-

honesty, immorality, stupidity, and weakness of will prevail. If we can conquer climate, the whole world will become stronger and nobler.

The steps by which this conclusion is reached are carefully revealed, together with a wealth of corroborative data which go to show that the psychologic and physiologic effects of climate are vitally involved in determining the efficiency and welfare of individuals.

It is rather disconcerting at this season of the year to learn that vacations in the summertime may give pleasant recreations, but they are more needed in the wintertime. It will be difficult to believe that "possibly the nervousness of Americans is due partly to the fact that although we relax somewhat in summer, we keep ourselves at high pressure through the winter when the need of relaxation is greatest."

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**Acidosis and the Adaptability of the Human Organism.**—No medical man in recent years has done more to shape medical thought than Crile. This has been the logical result of his comprehensive interpretations of bodily phenomena. In other words he has swept away a mass of theoretical rubbish and given to the scientific world a wealth of practical data that afford rational explanations for many physio-pathologic phenomena previously shrouded in uncertainty. Quick to perceive the quality of his work and the logic of his conclusions, the medical profession have been glad to accept Crile's views and follow his lead. And as he has given the results of his researches and studies to the world, his strength as a leader has grown, for the soundness of his teaching has been well verified.

To those who have followed Crile's investigations during the past decade or more, it has been especially interesting to note the constructive character of his work. The sum total of his studies is apparently reached in his latest book, *Man, An Adaptive Mechanism* (Macmillan & Co., New York). In fact, Crile himself intimates that this book is the climax of his investigations, the culmination of his years of research. It would be very easy to wax eloquent concerning this valuable work, for it unquestionably will rank as one of the most important contributions to modern scientific thought. Rich in its store of material

elucidating the great physiologic and pathologic problems of the day, this whole number could be devoted to a discussion of the facts this book presents. To show its great scientific value it will be sufficient, however, to refer to the chapter that discusses the topic most pertinent to this issue, acidosis.

After referring to certain questions arising in connection with the H-ion concentration of the blood, and the investigations undertaken in connection therewith, Crile says:

Many observations were made on animals near death from various causes. In each instance the blood became increasingly acid as death approached. This fact suggests the following question: Is the termination of life in many diseases, such as infections, Graves' disease, shock, etc., due to the failure of the body to maintain its alkalinity? Certain facts seem to support an affirmative answer to this question, namely: (1) the intravenous injection of certain acids causes death quickly; and (2) the intravenous injection of acids causes extensive histologic changes in the brain, the adrenals and the liver, which resemble the changes invariably caused by excessive activation of the kinetic system.

Studies were also pursued to ascertain if possible, the influence of morphine on acid-production and neutralization:

In animals already narcotized by morphine, the production of acid by any of the acid-producing stimuli was delayed or prevented. On the other hand, in animals in which an acidity had already been produced by ether, shock, anger or fear, the administration of morphin delayed or prevented entirely the neutralization of the acidity. In other words, morphin interferes with the normal mechanism by which acidity is neutralized, possibly because its depressing action on the respiratory center is sufficient to overcome the stimulating action of acidity on that center, for, as we have stated, the neutralization of acidity is in large measure accomplished by the increased respiration induced by the acidity itself; possibly also because morphin prevents the output of adrenin, and adrenin measurably governs the great acid-reducing organ—the liver.

From the studies of artificially produced acid poisoning, very important conclusions were reached. Thus the author states:

The establishment in the body of so powerful a group of organs and mechanisms for the elimination of the acid by-products of energy transformation shows how vitally necessary is the maintenance of the normal slightly alkaline reaction of the body. This indicates that acidosis is a factor in many diseases—acute and chronic—and that the centers in the medulla are stimulated by acidosis while the higher centers are depressed; it suggests an explanation of the phenomena of anesthesia, and that the ultimate cause of death is usually acidosis.

Crile's concluding words—summing up the facts presented—have all the beauty and majesty of a great poem when he says:

— in the complete life cycle of the individual from conception to death we see clearly here and dimly there the mechanisms by means of which a sensitive being immersed in a hostile environment effects survival—we see man—an adaptive mechanism.

**Back Injuries.**—Workmen's compensation acts bring to the foreground many types of injuries ordinarily deemed of slight importance. The traumatic neuroses are particularly baffling in times of litigation. Archibald McKendrick, in *Back Injuries and Their Significance*, (William Wood and Company) seeks to throw light upon our knowledge with reference to back injuries in order that more attention may be given to them. In a plainly written book, free from cumbersome technicalities, he has considered all the various phases of the subject. The most suggestive lesson which he presents is the word of warning to medical examiners to "beware of the fifth lumbar vertebra." To learn the reason for this caution, the book merits a reading.

**The Adolescent Period—Its Features and Management**, by Louis Starr, M. D. (P. Blakiston's Son & Co.) presents a valuable compilation of present knowledge with reference to the growth and physical development of children during the most important epoch of life. The book is strangely reminiscent and possibly owes much of its inspiration to the first volume of Stanley Hall's masterwork on adolescence.

Regardless of its origin, the book serves a distinct need and is untechnical, so that it is of service to parents and teachers as well as physicians.

The chapter on Sexual Enlightenment is frank and well balanced, free from dogmatism and, while optimistic, does not contemplate the immediate revolution of the adolescent mind.

#### BOOKS RECEIVED.

**Back Injuries and Their Significance Under the Workmen's Compensation and Other Acts.**—By Archibald McKendrick, F. R.

C. S. E., Surgeon in Charge of Surgical X-Ray Department, Royal Infirmary, Edinburgh. Octavo 168 + 12. Price \$1.25. New York, William Wood and Company, Edinburgh: E. & S. Livingstone, 1916.

**The Adolescent Period—Its Features and Management.**—By Louis Starr, M. D., LL. D., Fellow of the College of Physicians of Philadelphia, Fellow of the Royal Society of Medicine, London. Octavo, pp. 192+10. Price \$1.00. Philadelphia: P. Blakiston's Son & Co.

**Nervous Children—Prevention and Management.**—By Beverley R. Tucker, M. D., Professor of Neurology and Psychiatry, Medical College of Virginia, Richmond, Va. Octavo 147. Boston: Richard C. Badger, Toronto: The Copp Clark Co., Limited.

**The Freudian Wish and Its Place in Ethics.**—By Edwin B. Holt. Octavo, pp. 208+2 New York: Henry Holt and Company, 1915.

**Practice of Medicine.**—By James M. Anders, M. D., Ph. D., LL. D. Twelfth Edition. Published by W. B. Saunders Co., Philadelphia and London. Price, cloth \$5.50 net, half Morocco \$7.00 net.

**International Clinics.**—Edited by H. R. M. Landis, M. D. Volume II, Twenty-sixth series, 1916. Published by J. B. Lippincott Co., Philadelphia. Price \$2.00.

**The Influence of Joy.**—By George Van Ness Dearborn, Ph. D., M. D. Published by Little, Brown & Company, Boston, Mass. Price \$1.00.

**The Art of Anesthesia.**—By Paluel J. Flagg, M. D. Published by J. B. Lippincott Company, Philadelphia, Pa. Price \$3.00.

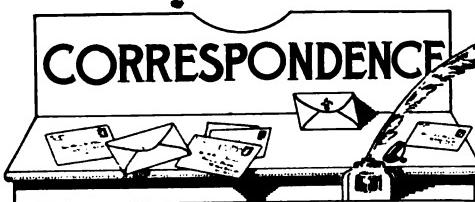
**Tobacco Habit Easily Conquered.**—By M. Mac Levy. Published by Albro Society, Inc., New York.

**The Mortality from Cancer Throughout the World.**—By Frederick L. Hoffman, LL. D., F. S. S., F. A. S. A. Published by The Prudential Press, Newark, N. J. (The Prudential Life Ins. Co.).

**Alcohol—Its Influence on Mind and Body.**—By Edwin F. Bowers, M. D. Published by Edward J. Clodge, New York, N. Y. Price \$1.25.

**Differential Diagnosis.**—By Richard C. Cabot, M. D. Published by W. B. Saunders Co., Philadelphia and London. Two volumes. Price per volume, Cloth \$5.50 net. Half Morocco \$7.00 net.

**The Treatment of Acute Infectious Diseases.**—By Frank S. Mara, M. D., Ph. D. Published by The Macmillan Co., New York City. Price \$3.50.



## The Physician and the Termination of Life.

To the Editor AMERICAN MEDICINE:

This letter, if published, must appear anonymously, since my signature might result in the embarrassment, not to say the injury, of some whom I have no desire to cause the slightest annoyance.

Conversing with a retired physician, I was surprised when he began to discourse upon the propriety of the attending physician, in admittedly hopeless cases, terminating life by some painless method. He narrated to me two instances in which, at the patient's demand, he had done this. I was so thunderstruck that I made no response. I ought to say that the speaker, while engaged in the practice of medicine, was always looked upon as slothful and incompetent, although his private life is spotless and his moral principles above all question.

Although I desire the opinion of the Editor upon this matter, and the Editor has not asked for my own views, I may say at the outset that I do not believe that the deliberate termination of human life by the attending physician is a course that can be entertained under any possibilities whatsoever. I would of course go to possible extremes in the matter of relieving pain, administering opiates and anesthetics far beyond what would be tolerated in ordinary cases, and might, under such conditions, bring about death prematurely; but I regard such a course of action as something wholly different in principle from the deliberate act of applying a certain portion of poison.

On one occasion I was implored by a man of high character, suffering terribly from the ravages of multiple sarcoma, to give him a fatal portion of morphine. I

felt so much outraged by the request that I replied, in high temper, "And so, after all I have tried to do for you, I am set down on a moral level with footpads and other artists in the noble practice of assassination?"

"Don't be angry with a dying man, but wouldn't you chloroform a poor dog?" came the response.

Yes, I would for humane reasons terminate the life of lower animal, but what has that to do with the case of a dying man?

I can hardly conceive of a case in which the physician, in case of doubt, might not retire from all responsibility by an instant dismissal of the patient.

But it is the Editorial view rather than my own that I desire.

Respectfully yours,

MEDICUS.

### Anti-Narcotic Legislation.

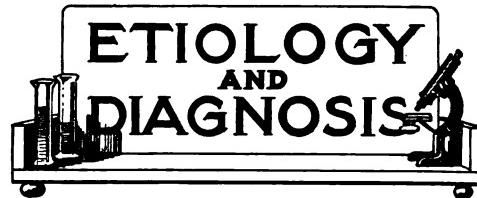
To the Editor AMERICAN MEDICINE:

At a special meeting of this Society, the thanks of the Federation were ordered to be forwarded to AMERICAN MEDICINE for its article in the April issue anent "anti-narcotic" legislation in New York State. This expression of opinion on a subject of vital importance to the present day practice of medicine is in entire accordance with the labors and efforts of the Federation in that line and is in refreshing contrast to the almost absolute silence by the so-called official mouthpieces and representative organs of the medical profession at large. It is hoped that this, the first successful opposition to the practice of making New York a proving ground for politico-sociological experiments by propagandists from everywhere will discourage the "Dowies" of our time, who by converting the city, hope to capture the country at large. Trusting you will continue the same "safe and sane" policy which prompted this note of appreciation, we are,

Respectfully yours,

THE FEDERATION OF MEDICAL ECONOMIC  
LEAGUES.

Per C. P. FRISCHBIER, Rec. Sec.



**The Etiology of Epilepsy.**—The researches of Reed in connection with epilepsy are growing in importance as their practical and far-reaching bearing on the treatment of this grave disease are realized. In this their report (*J. A. M. A.*, May 20, 1916) Reed directs attention with still greater emphasis to the fact that constipation or bowel stasis is a very essential factor in the causation of epilepsy, and that this forms the connecting link in some forms of infection. In this study he outlines his more recent experiments which lead him to the following conclusions: (1) Epilepsy is an infection depending on a specific spore-bearing organism which it would seem that one is justified in calling *Bacillus epilepticus*. (2) The *Bacillus epilepticus* invades the system through the alimentary canal, its chief focus being the cecum, from which it reaches the circulation by forced absorption induced by mechanical retardation of the fecal current. (3) The *Bacillus epilepticus*, by virtue of its spore-bearing characteristic, under ordinary circumstances and without appropriate treatment, has the ability in most cases to perpetuate itself indefinitely in both the cecum and the blood. (4) In a certain very limited number of instances, the *Bacillus epilepticus* seems to be overcome by the natural immunity, but only where there is no focus in the intestines for the continued infection of the system—a circumstance which would seem to account for the spontaneous recovery. (5) Treatment, surgical and bactericidal, to be rational and effective, must be addressed to the organism, with reference, first, to arresting its intake from the intestines, and, secondly, to its neutralization and eradication from the blood.

**Diarrhea and Acidosis.**—That a great many cases of infantile diarrhea are associated with acid conditions has been recognized for some time. Hence experienced clinicians will be ready to accept Howland and Marriott's conclusion (*Am. Jour. of Diseases of Children*, May, 1916) that the hyperpnea frequently met in severe diarrheas is probably dependent on the presence of acidosis. The presence of the acidosis was confirmed by determining a lowering of the carbon dioxide tension of the alveolar air, by an increase in the hydrogen ion concentration of the blood serum, by a diminution of the alkali reserve of the serum, by an increase in the amount of alkali required to alter the reaction of the urine (alkali tolerance) and by a diminution of the combining power of the hemo-

globin with oxygen. It is shown that the administration of sodium bicarbonate will often bring about a cessation of the hyperpnea and cause the laboratory tests to give the results that are found with normal infants. The acidosis is not the result of the presence of acetone bodies nor has it been demonstrated that it is due to loss of base. It is instead, much more probable that it is due to deficient excretion of acid phosphate by the kidneys.

The excessive diarrhea according to the authors should be prevented by opium in some form, such as paregoric, preferably in small doses, frequently repeated, to be reduced or stopped when the evacuations diminish in frequency or copiousness. Water must be given freely by mouth, if possible; if vomiting prevents this, as it frequently does, it must be given by rectum, subcutaneously or intravenously. When the presence of the acidosis is determined, alkalies must be administered promptly, until the reaction of the blood is again normal. The authors have used sodium bicarbonate for this purpose. Vomiting often prevents the administration by mouth, and absorption by the bowel is unreliable in the presence of diarrhea. The soda may then be given subcutaneously or intravenously. When a vein of sufficient size can be found, intravenous administration is the method of choice, even if there is no vomiting. Immediate action can thus be obtained.

The strength of the solution for intravenous use is 4 per cent. Depending on the size of the infant, from 75 to 150 c.c. of solution should be given and repeated in three hours if the hyperpnea does not cease. A large amount of alkali is required, for not only is the alkalinity of the blood reduced but also that of all the tissues of the body. After one or two intravenous injections, the soda should be continued by mouth in doses of 1 to 3 gm. every two or three hours until the urine is alkaline to litmus. In all cases of severe diarrhea, even though there are no evidences of acidosis, the authors deem it advisable to use sodium bicarbonate until the urine is alkaline. Its administration may prevent the development of acidosis.

**Hints in Diagnosis of Gastric Complaints.**—*The Med. Herald* gives the following valuable hints:

One should keep in mind that most gastric disorders arise in whole or in part from mental irritation.

In digestive disorders always look the patient in the mouth. They may be due in large part to his lack of teeth.

The stomach is twenty feet this side the appendix, but chronic gastric dyspepsia may have its origin in the distant organ.

Constipation is a frequent cause of stomach disorders.

Do not forget that gallstones cause disturbance of digestion.

A craving for sour food is said always to indicate lack of hydrochloric acid.

Few dyspeptics eat too little; most eat too much.

Much gastric disease is due to alcohol. Do not fail to probe for alcohol when taking the history of the case.

Be not too impatient of idiosyncrasies in food; they may be real.

The findings from stomach washings and test meals are not always to be relied on. Nervous influences may disguise the findings.

Do not fail to percuss the stomach after distension with vichy water or a selditz powder. When the stomach is distended the lower border should not come below the umbilicus.

A great help to diagnosis is to ask the patient to dine with you, or better, ask yourself to dine with him, and study his methods and materials of feeding.

Hyperacidity means irritation—local or reflex. Hypoacidity means depression from local or mental causes.

Do not forget eye-strain in the diagnosis of digestive disorders.

Bodily fatigue may have much to do with indigestion. Those who are overworked are always dyspeptic.

Disturbances of digestion may be due to the influence of toxins of tubercular infection.

**The "Sore Spot" and Acetonuria.**—In his exceedingly valuable paper on "Acetonuria and Carbohydrate Starvation" (*New York Med. Journal*, Aug., 1915) Blodgett thus refers to the sore spot found in cases of contagious disease, accompanied by acetone in the urine: "Vomiting, as the most marked symptom, occurs frequently where there is acetone and often diacetic acid without sugar in the urine. These patients usually have, in the beginning of the disease, at any rate, a clear tongue, and the vomiting occurs irrespective of what food may have been ingested. In almost all cases there is a sore spot that can be found on deep pressure over the region of the pancreas. This spot can be distinguished from the abdominal muscular soreness that follows attacks of vomiting by the fact that it is only found on deep pressure, and is a spot, perhaps only two inches in diameter, over the pancreas, while the muscular soreness following vomiting is brought out by superficial pressure and is more or less general over the entire abdomen. In extreme cases patients will complain of pain in the left hypochondrium and tell you that it is deep in. This 'sore spot' is almost pathognomonic of this condition."



**Inflammation of the Accessory Nasal Sinuses.**—Prompt and energetic treatment is demanded

if the condition is severe and threatens complications involving the orbit or cerebral tissues. Otherwise in acute cases Veasey (*Northwest Med.*, Mar., 1916) advocates expectant measures which can be carried out by the general practitioner. The general treatment should include thorough catharsis and the administration of aspirin, or aspirin and phenacetin, for the relief of headache. Sweating should be induced in the early stages, and much relief is to be secured from the application to the forehead and temples of iced cloths or hot compresses. The rest of the treatment should be directed to the combating of the nasal inflammation and congestion and the provision of suitable conditions for drainage of the sinuses. The turgescence of the mucosa should be reduced by the application of weak solutions of cocaine. Adrenalin should not be used, since its after-effects lead to greater congestion. After the mucosa has been shrunken, it should be cleansed by irrigations with normal salt or mild alkaline solutions. This should be followed by the local application of a twenty-five per cent. solution of argyrol or an oily spray. The patient should douche his nose freely every hour or two with hot salt solution; deep inhalations of steam laden with menthol and benzoin will keep his nose clear. Two tablespoonfuls of the following mixture may be added for this purpose to a small amount of boiling water and the vapor inhaled through a paper cone:

Menthol .....	gr. xxx
Tinct. Benzoin Comp. ....	3vi

**Treatment of Typhoid Fever.**—In a letter to the *Med. Summary*, Terry says he has used the following treatment with success:

1. First clear out the bowels.
2. As it is the typhoid microbe that causes perforation of the intestines give a tablespoonful of olive oil followed by a glass of hot water every 3 or 6 hours. Five drops of essence of peppermint can be added to hot water if so desired. If unable to retain it give an enema of half a pint of the olive oil using long tube once each day.
3. Need not urge nourishment for a few days if patient can retain the oil.
4. When beginning feeding give peptonized milk in alternation with cereals but no meat broth.
5. Compress of water kept constantly over region Peyer's glands.
6. Bichloride of mercury tablet, gr. 1-1000 three times a day until bladder irritation threatens, then discontinue.
7. Sponge off patient every 2, 3 or 6 hours as seems necessary for reducing temperature.
8. The tooth brush most important to scrub the tongue and teeth to clear off the various microbes; sordes always unnecessary. It should be used 2 or 3 times a day at least. In the water use an antiseptic tooth paste or some of the

simple preparations containing carbolic acid, iodine and sodium bicarbonate.

10. There will scarcely be a mortality with this treatment provided the best of nursing, pure air, the discharges and kidney secretions be received in antiseptic receptacles and properly removed.

11. Every effort should be made to remove the cause of the infection.

12. To purify the air should there be any odor of impurity, burn sulphur, use the small formaldehyde apparatus or evaporate bromine.

13. Give your druggist this: Bromine two drams; bromide of potash two drams; water one pint. Keep in glass stoppled bottle and do not inhale it directly from bottle. Mark it 1-64 Poison For External Use. Now use putting about a tablespoonful in a bowl of water allowing it to be placed in some part of room changing twice a day. You have in this one of the best antiseptics. It will permeate the entire room and region and will not be unpleasant used in that way.

**Food in Acidosis.**—In the treatment of acidosis alkalis (e. g. bicarbonate of soda) are helpful, but the administration of food, especially carbohydrates, is very important. Glucose feeding is very valuable both in the management and in the prophylaxis of acidosis, since a solution (5%-7%) can be readily administered by rectum or subcutaneously.—*American Journal of Surgery*.

**Magnesium Sulphate in the Treatment of Nasal Catarrh.**—Tulloch, in *British Jour. of Surgery*, claims that magnesium sulphate, by reason of its being absorbed with difficulty, has certain advantages over other salts used for cleansing wounds by osmosis; that it interferes with the digestive activities of pus, and that it inhibits bacterial growth.

These seem to us to be ideal recommendations for an osmotic treatment of catarrh in the nasal sinuses. We need such a treatment, to "poultice out" catarrh, as it were.

**Surgical Treatment of Old Gonorrhœal Infection in Women.**—The time was, states Spilman (*Jour. Iowa State Med. Soc.*), when gonorrhœa in the female was considered as being much more simple and much easier of cure than the same disease in the male, but this has all changed. It has been found that the uterus, ovaries and tubes are all peculiarly liable to become infected and in such a case no one can predict the outcome with any certainty. An infection of the endometrium is almost sure to be followed by infection of the tubes. Abscess of the tubes, if not properly treated, may be followed by more serious complications, such as

openings into the bladder and bowel. In such a case a portion of the bowel may so become diseased as to require excision for a length of several inches and of course this is a very serious condition greatly increasing the danger from general peritonitis. In any case, complete removal of the affected tubes must be effected. The question of the removal of both ovaries in this class of infection has been the subject of much discussion. The author believes in radical surgical measures.

**The Treatment of Hemorrhoids by Injection.**—Morley, of London, communicates to the *Lancet* for April 22d his nonsurgical method of treating hemorrhoids. He always uses the speculum for diagnosis. As he says, there are numerous cases of hemorrhoids in which bleeding, pruritus, or other troublesome symptoms exist, but in which the piles rarely or never prolapse and cannot be made to do so. Hemorrhoids cannot be felt even by the most highly trained finger. There is only one way to diagnose them, and that is by seeing them. If they are large and prolapse readily this is easy; but in the majority of cases the only way of seeing them is to pass a speculum. Nearly every patient with a rectal lesion diagnoses it himself as "piles," but in a large proportion of cases that diagnosis is incorrect or incomplete. Since some operators inject only piles that can be protruded either naturally or after an enema, and condemn all other cases to a continual use of local applications, enemata, attention to diet, and regulation of the bowels, etc., they deprive by far the larger class of patients of the benefits of the injection method, and reserve it for the worst cases, in which its success is least certain. The use of an enema is a very awkward complication in private practice, and practically prevents the use of the method at the surgeon's consulting room, while it would be a very troublesome addition to the treatment at an outpatient department, where numerous cases have to be dealt with in a limited time. Dr. Morley never needs an assistant, though he always uses a speculum; were he to use an enema, however, the assistance of a nurse, both at hospital and in private, would seem to be essential. He has had no trouble from hemorrhage, which never exceeds a few drops that can be readily soaked up with a single swab. He finds it easy to inject the fluid into the centre of each pile, or into its base, and can easily reach high lying piles by means of the speculum—piles which, though large, are unlikely to come down outside the anus.

**The Treatment of Acidosis in Childhood.**—In his valuable paper on Acid Intoxication in Infancy and Childhood (*Boston Med. and Surg. Jour.*, April 20, 1916) J. L. Morse says that the cause of the symptoms in acid intoxication be-

ing the withdrawal of bases from the organism as the result of an excess of acids in the system, it is evident that the treatment indicated is the introduction of alkalis into the system to neutralize the acids in the body and in this way to prevent the further withdrawal of bases from the body and to allow the reaccumulation of the bases which have been abstracted from the body. The best alkali to use is the bicarbonate of soda. This may be given by the mouth, by the rectum, subcutaneously or intravenously. It is preferable to give it by the mouth if it can be retained. It is best given in water, but, if desired, the taste may be disguised by orange juice or grape juice. It is seldom wise to make the concentration of the solution stronger than 1:20. It is usually better to make it 1:30 or 1:60. Stronger solutions are almost certain of themselves to cause vomiting. The general feeling is that as much soda should be given as possible. It is very probable, however, that excessive amounts of soda may of themselves cause vomiting and diarrhea, and perhaps poisoning. Morse is very confident that in a considerable number of instances in which he has been called in consultation to see cases of supposed "acidosis," the vomiting and diarrhea were the result of excessive doses of bicarbonate of soda and not symptoms of acid intoxication. In one instance, in which a baby of fourteen months received three ounces of dry bicarbonate of soda in twelve hours, the baby was collapsed and almost moribund, apparently as the result of the large amount of soda. Other alkalies may be used, but are, as a rule, not as satisfactory as bicarbonate of soda.

Bicarbonate of soda may also be given by the rectum. The solution should be stronger when it is given in this way. The solution is more often retained when it is given by seepage than by enema. Seepage is, in Morse's experience, the more satisfactory method. The solution used for seepage should ordinarily not be stronger than 1:10. It is, of course, useless to attempt to give soda by rectum when there is diarrhea.

When bicarbonate of soda is given subcutaneously, a 2% solution should be used. When given intravenously, a 4% solution is strong enough. The amount to be given must depend, of course, on the age and size of the patient.

The acetone bodies being formed chiefly from fat in the absence of carbohydrates or when there is a disturbance of the carbohydrate metabolism, another indication is to administer an easily absorbable and utilizable carbohydrate. Such a carbohydrate is glucose or dextrose. This may be given by mouth or by rectum. It is usually advisable to give the soda, both by mouth and by rectum, in a 10% solution of dextrose. In urgent cases dextrose may be given intravenously in the strength of 2½% of dextrose in normal saline solution. Kahlbaum's is the only readily available pure dextrose. When the vomiting stops and the patients begin to improve, the carbohydrates may be added in the form of the cereal waters or jellies, to which one of the various maltose-dextrin mixtures or lactose may be added.

Practically, the usual treatment is the administration of a 5% or 10% solution of bicarbonate of soda in a 10% solution of dextrose freely, both by mouth and rectum. In my experience the immediate and thorough cleaning out of the intestinal tract has seemed to have more effect on the outcome in those cases of acid intoxication secondary to infections or to diseases of the intestinal tract than any other single procedure.

It must be remembered that this treatment is simply for the condition of acid intoxication, and that this condition is not a primary, but a secondary one. Therefore, even if the condition of acid intoxication is relieved, the original causative disease remains. The patient may die, therefore, even after the acid intoxication is cured.

**Treatment of Acetonemia and Vomiting in Children.**—Howard Bucknell, in his interesting paper in the *Atlanta Journal-Record of Medicine* (March, 1916), says that in all cases of recurrent vomiting in children, or where there is severe vomiting, as a complication of other diseases, the urine should be tested for acetone, and if necessary, treatment instituted, whatever other conditions may be present. Vomiting, a serious complication in many infections, can thus be brought to assume a minor role. In cases of cyclic vomiting there is usually acetone, frequently combined with indican. Children thus afflicted have probably received carbohydrates in excess in a form not readily utilized by them, the result being intestinal indigestion, a relative carbohydrate insufficiency, and a compensatory rapid consumption of stored fat, part of which undergoes imperfect catabolism with liberation of acetone bodies. The writer deems it an error to state that while the cyclic attack is in progress little can be done to stay it. Many children vomiting for days till nearly pulseless, may be promptly relieved. Body fluids being rapidly drained through persistent loss of gastric juice and inability to take liquids by mouth, water should be supplied by rectum or, if diarrhea exists, by hypodermoclysis. If the stomach contains irritating substances, it should be washed out. The colon should also be irrigated, and a solution of sodium bicarbonate introduced into the rectum, to be retained if possible. To depress the vomiting reflex, bromides and chloral hydrate may be used by rectum, though chloretoe gave the writer better results. Where vomiting is not too severe, a solution of chloretoe in appropriate amount (e. g., one and a half grain in water, a few drops at a time, in a child about one year old) may be given by mouth, or through a stomach tube, after stomach washing with sodium bicarbonate solution. To make up for the deficiency of carbohydrates four to eight ounces of a five per cent. solution of dextrose should be administered, by rectum, in alternation with sodium bicarbonate solution to be retained. Usually by the time the effect of the chloretoe has passed

off, the sodium bicarbonate and dextrose absorbed have so decreased the nausea that dextrose may be given by mouth—a few grains at a time, up to a dram every eight hours. After a few hours of such treatment, vomiting usually ceases permanently. If it recurs, the enemas are to be repeated. As soon as the vomiting has ceased and a cathartic, such as calomel and milk of magnesia, has, if necessary, been given, feeding may be resumed, unless otherwise contraindicated.

**Alkaline Treatment of Hay Fever.**—In the management of hay fever, it should be remembered that there are often certain underlying conditions that constitute a nidus in which the germ of the disease develops some auxiliary cause, that promotes its development. In studying these causes there is justification for suspecting the presence of general acidosis, because of the marked acidity of the urine. Kell-off (*New York Medical Journal*, August 21, 1915) expresses the opinion that this general acidity results in certain irritating qualities of the blood, making the mucous membranes unduly sensitive.

As an experimental test of his theory he gave two patients dram doses of the bicarbonate of soda three times a day in order to neutralize this general acidity and determine the truth or falsity of his theory. So marked was the relief in those two cases that he has carried it out in fifty cases during the past three years. There was benefit in ninety per cent of the cases, and in seventy per cent there was complete relief after a few days. In the remaining ten per cent there were minor benefits, all of which greatly encouraged the writer in believing that he had developed a theory that was correct in the main.

With this condition upon which the cause of the disease depends, he found that some must have a secondary exciting cause. These occurred from the pollen, in some cases, from rag-weed; in others from golden-rod or cotton-weed; the development of the condition depending upon the time of the season when the growth of these vegetable substances arrived at the time when the pollen would be most irritating.

The alkali reduced the acidity; there was a general reduction in the irritation, and he believed also that the agent prevented the extraneous substances from exercising their irritating properties. In three cases where the internal use of the sodium salt was not so beneficial, he obtained much benefit by spraying a solution of the salt into the nasal passages.

**Buttermilk as a Gargle.**—Moffit (*Penn. Med. Jour.*, Oct., 1915) suggests the use of fresh buttermilk as a gargle in patients who have had diphtheria but in whose throats cultures of the diphtheria bacillus were present after all other manifestations of the disease had disappeared. The plain buttermilk was used five or six times a day and from his experience with nine cases,

Moffit believes that the diphtheria organisms will be displaced entirely within three days, while pure cultures of the lactic acid bacillus will be found on the swab.

This is in harmony with a suggestion recently made (AMER. MEDICINE, Dec., 1915, p. 926) to use cultures of the bacillus bulgaricus for the same purpose. Swabbing the throat (or gargling) two or three times with the commercial liquid cultures of this organism is sufficient to render the throat free from dangerous organisms and to facilitate the releasing of the patient from quarantine. It was also suggested that this same procedure might be equally useful in diphtheria.

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**Hypertonic Saline Solution in Gynecology.**—In the *Medical Record* (Dec. 25, 1915, p. 1097), editorial mention is made of the value of applications of hypertonic saline solution in the treatment of surgical affections of the female pelvis. Considerable success with this method has been reported by Wright and others in the treatment of septic shell wounds, and Clifford White (*Lancet*, Oct. 30, 1915), has applied this same idea in gynecology. He uses a solution containing 4 drams of sodium chloride and  $\frac{1}{2}$  dram of sodium citrate to a pint of water. This is used as a vaginal douche and local application to inflammations and septic conditions. Especially in puerperal cases is this valuable, and where sloughing of the perineum and vaginal tissue was present the effects are said to have been extraordinary.

White also advises after cleaning out the uterus in puerperal sepsis, and as a routine in cases of abortion, that several tablets of salt be left in the uterus to ensure that any organisms left there are flooded with the serum that is drawn in to dissolve the salt. The value of brine enemas was also referred to as being beneficial in abdominal cases and especially for the obstinate constipation which often accompanies eclampsia, for in such cases soap water enemas may be retained and turpentine is absolutely contraindicated because of the renal condition.

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**Unna's New "Dusting Powder Substitute."**—Presumably because of the need for special care in the conservation of food materials in Germany, Unna has been experimenting with several substitutes for starch as a dusting powder in eczema, sunburn and other skin conditions in which it has been previously regarded as one of the best applications.

Unna now recommends a cooling paste with the following formula: Thirty mils (c. c.) each of linseed oil and lime water are mixed with 20 grams each of zinc oxide and calcium carbonate. This paste combines the drying properties of starch with the action of a dilute alkali. Unna uses it in burns, eczema, erysipelatoid conditions and other forms of dermatitis.

Where an antiseptic action is desired the calcium carbonate may be replaced with calcium chloride. Another modification of the above formula consists in reducing the amount of zinc oxide to 15 grams and adding 10 grams of flowers of sulphur. In addition to the cooling and soothing properties, both these pastes are hygroscopic.

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**A Menthol-Oil Solution in Nose and Throat Work.**—The use of oily sprays containing greater or less proportions of menthol and other drugs is by no means a new method in otorhinology. Voorhees, however, has been modifying his use of these substances and reports some encouraging results from strong menthol-oil solutions containing from 5 to 25% of the drug (*Boston Med. & Surg. Jour.*, Nov. 4, 1915).

In outer ear troubles he packs the canal with gauze soaked in a 10% menthol-oil solution. Direct tracheal applications (with a laryngeal syringe) are made in acute bronchitis with what Voorhees calls "astonishing" results. In acute laryngitis the solution should be dropped directly on the rima glottidis during phonation. In local affections of the nose the solution may be applied twice a day by means of a swab, or on gauze lightly packed into the nasal passages. If complaint is made of the burning sensation caused by strong solutions, cocaine may be used prior to the treatment. In acute rhinitis the head is tipped back and a 5% menthol-oil solution slowly dropped in with an ordinary medicine dropper, while in pharyngitis swabbing with a post-nasal applicator is better than spraying. It seems that the advantage of this method lies in the much greater strength of menthol used, and it is worthy of a much more extended trial.

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**The Treatment of Menorrhagia.**—In some forms of menorrhagia, especially when associated with carcinoma or uterine fibroids, the old-fashioned, local use of a solution of iron, Monsell's solution or the tincture of ferric chloride, is still an efficient procedure. The uterus should be packed with gauze saturated in either of these solutions. The packing may be left in as long as a week without becoming offensive or developing disturbing conditions (Watkins at Miss. Valley Med. Ass'n, Oct. 19-21, 1915).

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**Constipation in the Sedentary.**—A patient presenting himself for the first time, says Dr. W. M. Gardner (*N. Y. Med. Jour.*, Mar. 18, 1916) is thoroughly cleaned out with calomel and a saline. The dose is regulated according to the statement of the patient concerning the ease or difficulty of attaining a movement with his favorite cathartic, which is ascertained. This is a mere beginning and is followed with a combination prescription based on the condition found. For simple atony of the bowel cascara

with nux vomica in tablet form at bedtime may be sufficient.

If with his constipation there is biliousness or sluggish liver with its symptoms of dizziness, headache, lethargy, chilliness even in a warm atmosphere, sour stomach, tenderness over the gall-bladder, often subnormal temperature, etc., then the following combination is given with the usual doses:

Podophyllin;  
Sodium glycocholate;  
Strychnine sulphate;  
Extract cascara;  
Extract hyoscyamus;  
Extract gentian.

This is given in capsules just before meals, otherwise the bile salt upsets the stomach if it is a fresh preparation.

In some cases it is necessary to add to this compound extract of colocynth. If flatulence is associated, salol is indicated. It may be substituted for one of the others.

If the appetite is poor or the patient is run down, some of the others, especially gentian, may be omitted, and arsenic, mercury, and iron added. If the whole system is inactive so will the bowel be. Treating constipation should mean more than daily flushing out the bowel.

This combination capsule gives at once an appetizer, blood builder, and liver stimulant, increasing the flow of bile so needful in the intestine. It softens the stool and stimulates the bowel to do muscular work. If modified to suit the case, it works, and if properly gauged, it does not work too hard.

If the case is one with very hard, dry stools, mineral oil is indicated, with cascara or a combination prescription as the cathartic after the calomel and salts.

Occasionally a mucous colitis is associated with such cases of constipation, causing sudden diarrhea with pain and griping. Here the abdomen should be kept warm and internally phenolsulphonate of zinc or salol should be given until effective as an antiseptic and astringent with enough cathartic to prevent hardening of the stool, which aggravates the catarrhal condition.

Cascara is the best cathartic for steady use, or the old a. b. and s. pill with ipecac is good unless there is associated a sluggish liver, which calls for more.

Having established regular movements with drugs, there now begins the harder part of establishing regular habits and proper eating. By regular habits I mean three things:

1. Attending to the bowel at a regular time.
2. Attending to the bowel whenever there is a desire for evacuation, instead of putting it off until a more convenient time. These things are impressed upon the patient.

3. Exercise. It should become a habit to exercise. The kind is that which doubles and bends the abdomen as the so-called tree swaying, wood chopping, grand bend, etc. Then exercises which call into play the abdominal muscles so as to compress the abdomen, as lying on the back and lifting both legs while the arms

are folded across the chest. Walking and running and jumping are good. All these exercises mentioned require no apparatus and can be done in one's room. Walking from business gets one into the open air.

By proper eating I refer to four things:

1. Regular eating and not eating between meals. The full meal starts up a better peristalsis and exercises the musculature of the digestive tract.

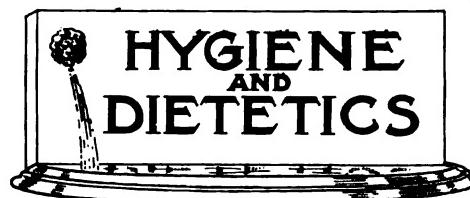
2. Proper mastication of food. Bolting a meal means undigested food with fermentation and accumulation.

3. Eating the proper amount of food. By the full meal I do not mean stuffing, but there should be sufficient quantity, so that out of it there will be sufficient waste to form bulk for the intestine to work upon.

4. The proper kind of food. The modern diet is too refined. Reversion to the coarser foods is good. Also avoidance of too much coffee and especially tea. If the liver is sluggish it is well to limit quite considerably tea, coffee, sweets, fats, and pasty foods such as bananas and warm bread, etc., also tomatoes (and the slops of the confectionery stores). On the other hand, prescribe cereals, fruits, especially juicy fruits, and vegetables leaving a large amount of residue, such as string beans, cabbage, cauliflower, turnips, spinach, kale, celery, etc. These foods leaving a large amount of residue help the bowel to work. It is easier to squeeze a ball than a marble. Apples are especially good in some cases.

The cathartic is gradually reduced as the bowel is found to act of itself, and is finally omitted altogether.

Theoretically, organotherapy would seem ideal by restoring the normal secretions of the gastrointestinal tract in treating constipation, but the mechanical factor cannot be eliminated altogether and to the exercises may well be added massage.



**Dietetic Treatment of Cardio-Vascular Disease.** The "Karell Treatment."—In the acute form of heart affections, Satterthwaite (*Interst. Med. Jour.*, Jan., 1916) says that nothing but fluids should be given. If milk is well tolerated, it may be taken to the amount of 1 1/2 to 2 quarts a day. Some prefer buttermilk, and Bulgarian sour milk is popular. The selected form of milk food may be diluted with vichy or some alkaline water when plain milk is not well tolerated.

The Karell dietetic treatment, which has been employed by Lenhardt in his clinic, in Ham-

burg, for eighteen years, has met with much favor. During the first six days of this treatment, 7 ounces of milk, boiled or raw, hot or cold, is given at 8 a. m., 12 m., 4 p. m., and 8 p. m.—a total of 28 ounces daily. During this period, no other aliment is allowed. During the following two to six days, one egg is allowed at 10 a. m., and zwieback at 6 p. m.; afterwards two eggs and bread; and, later, a little chopped meat, vegetables or rice pudding, until at the end of the twelfth day the ordinary diet is resumed. During this form of treatment, the bowels should be kept open.

The fundamental rule in the dietetic treatment of cardiac disease of Satterthwaite is that the diet should be sparing. If the patient is kept in bed, food should be given at intervals of two to four hours, and the last meal of the day should be taken not less than two or three hours before retiring. Great care should be taken to avoid gastrointestinal disturbances, remembering that red meats and carbohydrates (which cause fermentation) are the chief cause of alimentary trouble.

Except in emergencies, the patient should be given no alcohol or malt liquors, and coffee and tea should be prohibited, as a rule. Water should be taken freely if there is an associated lithemic condition, which is likely to be the case; but it must be remembered that, by adding to the quantity of circulating fluid, we are throwing an additional burden upon a weak heart.

**The Growing Interest in the Vitamines.**—Study and research are emphasizing the importance of those vital substances in foods that Dr. Funk has called vitamines. Much difficulty is being encountered in ascertaining the chemistry of these products owing to their complex character and intimate association with other chemical bodies. However progress is being made and we shall soon know a great deal about their composition and nature that is now hidden in obscurity.

With reference to the action of the vitamines, very little as yet is definitely known except that they bear a certain relationship to the carbohydrate metabolism. Doctor Funk has found, according to a writer in the *Medical Record* (June 10, 1916) that giving animals food composed largely of carbohydrates brings on an earlier appearance of the symptoms of deficiency diseases. For instance, if a pigeon is fed on polished rice it is possible to estimate approximately when the symptoms of beriberi will appear after a given quantity of rice is metabolized. Dr. Funk has confirmed this with an artificial diet composed of variable amounts of carbohydrates, and has also found that the blood sugar content in avian beriberi is greatly increased. This fact has a practical bearing in infant feeding; thus it must be borne in mind that a certain amount of vitamine can only take care of a limited amount of carbohydrates and when the starch is increased in the diet the amount of vitamine-containing foodstuffs must be increased in proportion.

A second fact which has been established in connection with the metabolism in deficiency diseases is that in the absence of vitamines not only a negative nitrogen balance is obtained, but the whole metabolism goes wrong; this is particularly noticed in the negative balance of inorganic constituents like calcium, phosphorus, and sulphur. Schauman has recently shown that the addition of vitamine puts the whole metabolism again on a normal basis and this fact is of special importance for the understanding of certain conditions like rickets in children. It has been found further that vitamine, when properly prepared and added in sufficient amount to polished rice, will make the latter diet complete. Dr. Funk has shown, in addition, that no animal was yet found able to live more than a short time on a vitamine-free food and that an artificial diet composed of casein, starch, fat, sugar, and all the necessary salts will produce a deficiency disease of some kind according to the animal chosen. To this diet all known lipoids, cholesterol, various proteins, and all sorts of salts can be added and nothing can save the animal or man from certain death unless vitamine is added. When all these facts are properly classified, correlated and understood it seems certain that we shall have a wealth of data of the utmost importance in helping us not only to understand many metabolic disorders but also to effect their correction.

**Water Drinking at Meals.**—Cutler, in the *Boston Medical and Surgical Journal* (June 24, 1915) reports that he finds that the daily consumption of about three quarts of water with meals for a period of five days, in a young man aged twenty-two years, caused an increase in weight of two pounds. The free use of water at meals, according to Cutler, seems to increase the flow of digestive fluids, to increase peristalsis, and to hasten absorption, and the fats seem to be more completely digested. Dilution does not diminish the action of the digestive juices, for the reason that enzyme action is greater (within limits) the greater the dilution. The author concludes, as a result of his clinical observation and laboratory research, that it is desirable for persons in ordinary health to drink water with meals as desired, or to the extent of two or four glasses at each meal, provided the food is well masticated.

**First Case of Rabies in England In Many Years.**—Through the operation of rigid quar-

tine regulations and by the muzzling of dogs, England has been able, says *Popular Mechanics*, to completely stamp out rabies. What is declared to be the first case since 1902 occurred recently in a dog that was being held in a six months' quarantine which the English law imposes on all canine pets brought into the country. It is said that Australia and New Zealand have never had any cases of rabies. Sweden, Norway, and Denmark are practically free from the disease.

**The Continuous Bath as an Analgesic.**—Another use has been found for the continuous neutral tub bath. At the large open-air hospital connected with the University of Cambridge, it was found that many of the patients arriving there had such terrible wounds that the pain made necessary such large and frequent doses of opiates that their progress was seriously retarded. In an attempt to remedy this Col. Griffiths now keeps these cases comfortably suspended in a tub through which water at 100 degrees is continuously running.

One case which is referred to had lain on a rubber mattress in a bath of this character for six weeks and while for a period before entering the bath the uncontrollable pain from a laceration of the thigh was so great that the officer feared he would go insane, in the bath he "had not felt anything worse than the usual discomfort from long confinement in bed."

**Cactus in Heart Affections.**—Some years ago a number of very decided statements regarding the uselessness of cactus were made, being based on experiments with animals in which no appreciable influence followed the administration of various preparations made from the Mexican *cereus grandiflora*. Not many of the profession agreed with these statements, particularly those who had had occasion to use cactus in clinical work with individuals manifesting well-defined cardiac weakness.

In a most comprehensive survey of "Drug Therapy in Cardio-vascular Diseases" Satterthwaite of New York, (*International Clinics*, 1916, vol. 1, p. 26) speaks favorably of his use of cactus and adds this significant remark:

"I am aware that experimentation on animals has been used to prove that cactus is inert, whether given by the mouth or vein, but on this point clinical experience appears to have demonstrated its utility." Satterthwaite is not alone in his profitable use of this remedy, for many physicians have come to regard cactus as a useful cardiac tonic.

**A New Method of Treating Chorea.**—For many decades arsenic in one form or another has been the standard remedy for Sydenham's chorea, and it has served the profession well.

Within the past few years the impression is gaining ground that chorea is a clinical manifestation of a hidden infective process and the frequency with which acute rheumatism is associated with chorea, or other infections than tonsillitis seems to be a confirmation of this.

With this in mind Mayer of Pittsburg, has been treating a series of choreic children with phenol. (*International Clinics*, 1916, vol. 1, p. 1). His method is to inject directly into a convenient vein ten minimis of a one per cent solution of carbolic acid. This is usually done on three successive days and the clinical reports made by Mayer seem to indicate that this is an effective procedure.

In some instances one injection caused a remarkable improvement, while in others more than three injections were given, a period being allowed to elapse between the third and subsequent injections. An explanation of the manner in which the benefit is brought about is not yet forthcoming, but the procedure is of sufficient promise to be tried more extensively. It is only fair to state that Mayer prescribed complete rest as a part of the treatment, but while this may have had its good effect, it was responsible for only a small part of the benefits obtained.

**Gall-Bladder Disease.**—Gall-bladder disease may be divided into three stages, says W. A. Dennis, M. D. (*St. Paul Med. Jour.*, Apr., 1916). "The first is marked by a definite type of indigestion, characterized chiefly by eructation of gas and qualitative food distress. The symptoms of this stage are the same whether stones are present or not. These symptoms, together with previous freedom from any digestive trouble, and especially if there is also a history of earlier inflammatory condition in the abdomen, make a fairly certain diagnosis. The chief danger of error is in dealing with ptotic and neurasthenic types, but these persons are ordinarily easily recognized, and moreover do not present the typical history described unless cholecystitis is present.

Operation in the first stage of gall-bladder disease offers the best outlook for both immediate and remote results.

The second stage, and the only one heretofore generally recognized, is that of local complications, mechanical and inflammatory.

The third stage is characterized by degenerative or sclerotic changes in the vital or other organs, due to the long continued effects on them of toxic or septic products absorbed from the local focus into the circulation and distributed by it to all parts of the body. The most common of these changes are myocarditis, arthritis, neuritis, nephritis and arteriosclerosis.

The recognition of the disease in its first stage and its proper treatment at this time means the prevention of both the second and third stages and the avoidance of at least 75 per cent of the morbidity or mortality. The proper treatment is, with few exceptions, cholecystectomy."

# American Medicine

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**Poliomyelitis Epidemic.**—There can be no question of the seriousness of the epidemic of infantile paralysis that New York City is suffering from at the present. We have no patience with misguided efforts to minimize its gravity and discount its dangers. On the other hand, one or two of the Metropolitan newspapers have exaggerated matters—as they always do—and have created an alarm that might easily develop into a real panic. We have no more patience with this course than with the former. On the whole, however, the better class of newspapers have handled the situation admirably and these deserve the heartiest commendation of the medical profession. They have given the facts plainly and truthfully and carefully avoided any and all sensationalism. We doubt if any other epidemic as serious as this one has ever been handled by the press in a more intelligent and sensible manner. If the daily newspaper has ever justified its purpose, it has in connection with the present situation. Doubtless many of our leading officials recognize this, for though we may be mistaken, we believe we have seen an earnest attempt at cooperation between the health authorities and the daily papers that cannot be too strongly commended. Some officials complain at the methods of the press—often with more or less warrant, for newspapers are sometimes wrongly conducted as are other human institutions—but it should be remembered, in the fight for municipal

or community health, or in the combat against any disease, we have no other agency with such great possibilities as the daily paper. It is our most potent educational force, and can reach—and influence—the masses as no other force or agency can. We can imagine no other single way, therefore, in which the public health official can accomplish more in his conflict with disease than by working—frankly and freely—with the daily press.

**The work of the local Health Board** has been excellent. New York City is fortunate indeed that its Health Commissioner is a man of conspicuous ability and force. Several attacks on the health authorities in connection with the present epidemic have been made—though why, Heaven only knows. Before criticising our public health officials, or taking them to task for failure to do just what we would like to see done—or to accomplish what we would like to see accomplished—we should be generous enough to stop and consider some of the manifold obstacles health officials are bound to encounter in New York City. The size of the city, its particular topography, its enormous population, its concentration in certain districts, its many different nationalities speaking widely different languages, the deep-rooted habits and customs of the people, their varied beliefs and superstitions, the illiteracy and ignorance of certain classes and finally the pov-

erty of a considerable proportion of the people, all combine with wilful negligence and indifference to make New York City one of the most difficult cities in the world in which to enforce sanitary rules and regulations and prosecute a campaign against disease. Under the circumstances, and in the face of unavoidable conditions our health officials have fought a splendid fight. It is hard to see how more could be done, or a campaign conducted more vigorously and efficiently. In regard to certain details each person is apt to see ways in which he might pursue a different course. It is natural for every physician to view a situation such as this infantile paralysis epidemic from his own standpoint and in the light of his own knowledge and experience. But "watching the game from the bleachers"—or "the side lines"—is vastly different from being in the game itself. The official with the added burden of responsibility is in a very different position than the bystander merely looking on. This is the thing we all must remember when we wonder why a public official does not do as we think we would were we in his place. Give us his responsibility and confront us with his difficulties, and our course of action may be very different from what we feel it would be.

There is one great reason for congratulation concerning our local health officials, and that is the way they have kept their poise during a very trying time. Fortunately they have not become infected or inoculated with that most distressing of ills—"official hysteria." There may have been occasional attacks among subordinates, but the leading officials on whose efforts everything depends, have maintained a balance and calm that have inspired the deepest respect and confidence. It has been certain health officers

in out-lying towns that have suffered most severe attacks of "official hysteria." This has taken a very aggravated form in some cases with the result that much needless annoyance and inconvenience have been caused the travelling public. Ridiculous rules and restrictions have been put into effect without sense or warning, and dangers that were very slight have been magnified to enormous proportions. Tired mothers with nursing babes and trailing little ones have been held up and kept for hours in hot, sweltering stations—when they expected the cool shade and green grass of some country home—solely because they came from New York. Others in automobiles have been prevented passing through certain towns on the highway, for the same reason.

We do not object to the health officers of nearby towns taking every reasonable precaution. Some people have shown a supreme indifference to the interests and rights of others. They have not seemed to care if they did carry the infection to neighboring towns, and several families have even taken children suffering with the disease to other cities. The health officers of adjacent communities would be very remiss and derelict if they did not protect their people. But they can do their duty efficiently without contracting "official hysteria," and this is what we mean. They can temper enforcement of their rules with common sense and mercy; they can be efficient and at the same time humane.

We should aid them in every way we can, but above all by striving to get the people to realize their sanitary obligations to each other.

Poliomyelitis is a serious disease and our lack of definite knowledge of how it is transmitted and contracted, forces us to

broaden our precautionary measures beyond what some day will be shown to be necessary. But there is no reason for senseless fear, losing our heads and resorting to methods that will increase the suffering of the afflicted, the sorrow of the bereaved, or the needless hardships of the people at large. There is no reason for a panic—not the slightest—and the strong, capable men who have the situation in charge will handle matters as they should be.

**The conquest of poliomyelitis** is essentially a problem of prophylaxis. Under present conditions the disease is seldom recognized until too late to prevent the damage it is going to do in each case. In spite of the splendid researches of several observers we are still in the dark as to the exact means of transmission of the organism—or virus as Flexner speaks of the infecting material—and its mode of entrance to the human body. From what we do know, however, and what we may logically deduce, we are able to form some fairly definite conclusions on which we can build a rational scheme of prophylaxis. The crisis that confronts us in New York City certainly demands that the most perfect and comprehensive scheme or plan of prophylaxis be constructed and taught to the people. In a way this present epidemic may be a Godsend, for the people are probably now more receptive and ready for prophylactic teaching than ever before. At any rate, much may be accomplished and a year hence we may witness a lower death rate than has ever been recorded.

The remarks that follow are not presented with the idea of instructing anyone. They are offered merely as suggestions—"from the side lines." Undoubtedly, our health officials are utilizing every possible means of instructing the people and giving them full and explicit information. It may

be possible, however, that some who read the following have not looked at the situation from the same angle. Believing that, at a time like the present, every earnest physician owes it to his profession to add his mite to the solution of the presenting problem—if only by reiterating—or expressing in his own way—already known facts, we do not hesitate to advance the opinion that the prevention of poliomyelitis depends on better sanitation in the home—the more explicit instruction of mothers and housewives along certain definite lines. The virus of poliomyelitis, according to Flexner "enters the body as a rule if not exclusively by way of the mucous membrane of the nose and throat. The physical properties of the virus of infantile paralysis adapt it well for conveyance to the nose and throat. Being contained in their secretions, it is readily distributed by coughing, sneezing, kissing, and by means of fingers and articles contaminated with these secretions, as well as with the intestinal discharges. Moreover, as the virus is thrown off from the body mingled with the secretions, it withstands for a long time even the highest summer temperatures, complete drying, and even the action of weak chemicals, such as glycerin and phenol (carbolic acid), which destroys ordinary bacteria. Hence mere drying of the secretions is no protection; on the contrary, as the dried secretions may be converted into dust which is breathed into the nose and throat, they become a potential source of infection."

Careful clinical observation substantiates the foregoing and there can be no question that while the organism of poliomyelitis may be conveyed directly by kissing, sneezing, etc., by various carriers, and possibly by certain insects, it also is transmitted by dust and filth. This being the case there are abundant reasons for believing that polio-

myelitis, like tuberculosis, is largely a house disease. The resistance of the virus of poliomyelitis to drying; its rapid destruction by sunlight, but indefinite life in darkness or weak daylight; and finally its resistance to other physical conditions such as the highest summer heat, etc., all favor the conclusion that it is mainly conveyed by indoor dust and dirt. Continuing this line of thought it is apparent that the ones who become infected are the little children, those who play or live on the floor where there is most dust and dirt. In fact, observation and study of a considerable number of families in which poliomyelitis has occurred have shown the writer that where there are several children in a family, the one first to become infected is usually the child playing on the floor. Of course older children may become infected by other means and convey it *directly* to other members of the family. But in numerous instances within the writer's observation, in families in which there have been several children large enough to play out doors, and a baby kept indoors mainly on the floor, it has usually been the baby that contracted the disease. The careful study of cases under three years of age will furnish abundant evidence to support the contention that a large percentage of these little patients get their infection from the floors of their homes, particularly among the poorer classes where carpets and rugs are the rule, and the broom is relied upon for gathering up the visible excess of dirt and filth brought in from the streets. Some one in seeking to combat the belief that dust is one of the principal means of transmitting the virus of poliomyelitis has called attention to the fact that June and the early part of July this year were wetter than for many years. This very fact substantiates rather

than controverts the dust carrying theory, for the wetter the season the more mud and filth adhere to the shoes to be brought into the house and become dust! This was surely the condition this year and the wet season with its larger amount of tracked-in filth was probably a very potent factor in the present epidemic.

From the foregoing idea that poliomyelitis is largely contracted in dust-laden homes it follows that their more careful and thorough cleansing is imperative. As a mighty important detail, therefore, in the effort to control the present epidemic, it would seem that homes in infected districts should be given more special attention. This does not mean fumigation for the efficiency of fumigation is an open question. But to go into these infected homes with vacuum cleaners and then disinfect them as they should be by effective means will probably go a long way, not alone to control the present epidemic but to prevent the recurrence of the disease another year. Still more than this, such a cleansing will probably remove many other infectious organisms, only waiting favorable opportunities to produce their baneful effects.

In addition to cleansing their homes, the people should be shown the danger of dust and dirt, and taught not only to keep the floors and furniture clean, but to avoid bringing dirt into the house on the shoes. To this end every person should be encouraged to clean the shoes with care before coming indoors. Finally, *a persistent campaign should be conducted against letting little children play on the floor.*

The one all important thought we would like to have the foregoing leave in the minds of those interested is the desirability of the utmost explicitness in showing the masses the way to cleaner, more sani-

**Physician (To Law, Government, Authority and the Public):**  
"Come on over and help me weed the garden!"

tary homes. The mothers and housewives are ready—many of them eager—to do what is necessary to protect their little ones against disease. But what they need is the simplest, most elementary instruction. Everything must be told them with the greatest particularity. Generalities will accomplish nothing. It is realization of this, from practical experience in striving to spread the gospel of sanitation, that has led the writer to lay the emphasis he has on home cleanliness. The great error we are all making is in crediting even the intelligent laity with knowing more than they actually do concerning the practical details of sanitation. In pointing the way to cleaner homes, there may be found the secret of controlling the present epidemic.

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**Medical Preparedness.**—The state militia has been mobilized. The first line of reserves has been called into action, at least for the purpose of protecting the American border from invasion by irresponsible Mexican bandits. Whether an actual state of war is to exist or not is in a sense of secondary importance. Battle against disease at least has been declared. It is impossible to concentrate large numbers of men drawn from the walks of civil life, comparatively untrained in matters of personal hygiene as involved in concentration camps, without incurring many dangers from disease. The transportation of men from northern climes to the violent heat of the Mexican border is in itself sufficient of an alteration of conditions to create disadvantages to the troops unless particular precautions are taken.

The medical history of the Spanish-American war is not a source of national pride. During the eighteen years that have elapsed since the brief Spanish encounter, sanitary science has made remarkable strides

and the contributions of military investigations have been commendably large. It remains to be demonstrated, however, in how far the medical department of the army has assimilated the advances which have been made and has prepared itself to apply the sanitary principles in the field with a view to the prevention of disease as well as its conquest.

The utilization of medical officers as sanitary inspectors on a large scale is on trial. Their resourcefulness, initiative, and ability as educators will determine their results. With vaccination against smallpox and antityphoid inoculations, there is every reason to believe that our troops will be spared these devastating visitations, which at times have attended troops thus unprotected. There is to be a fight, however, against malaria, against typhus fever and the similar plagues of the Mexican climate. The war against flies, mosquitoes and lice will be merrily waged. Water supplies will be tested and checked up for purity and safety. Latrines will be scientifically built and sewage disposal will be well looked after. Bathing facilities and opportunities for the sterilization of clothing will also be provided. Civil and military hospitals will be established or organized on a military basis with a view to providing the maximum care for those upon whom serious disease has fallen. With all the knowledge that is available, our Army is theoretically equipped. Time alone will show whether the Medical Department has adequately prepared to meet the emergencies of a large mobilization with a thoroughness warranted by the unhappy experiences of 1898. Here at least is an example of the fact that while knowledge is power, it is merely a potential power unless the proper agencies have been developed for the application of that knowledge.

For years, the Medical Department has not received the full measure of consideration in the army appropriations. The proportion of medical officers has been small despite the evidence of the importance of large medical organizations that has been made manifest by recent European experience.

**A medical reserve corps** amounting to about 2,000 in number has been gathered together without particular attention being given to the age of the applicants, or the type of work they have been accustomed to perform in general practice. Only a negligible amount of training has been given them through correspondence courses by lectures, and a few have voluntarily benefited by brief stays at summer encampments. Under the new Hay bill, the Medical Reserve Corps goes out of existence and passes into the Officers' Reserve, while the number of medical officers has been increased to 7 per thousand of the fighting force.

Organization on this basis, however, has not reached its fullest development. From the standpoint of practical efficiency, it is not possible to transplant physicians from civil practice to military life. Merely being a physician or a surgeon does not prepare a man for assuming the duties and responsibilities of an officer in the Medical Department of the United States Army.

Regardless of the large amount of administrative work falling to the lot of the higher medical officers in an army, the problems of camp organization and sanitation essential to maintaining the effective strength of an army are not matters of common medical knowledge. The knowledge of map reading, the interpretation of official orders, the range and efficiency of weapons, the difficulties of affording transportation

facilities to relieve the fighting force, and to remove the incubus of the sick and the wounded are not matters which can be absorbed by mere book reading, or, indeed, from lectures.

The four large functions of the medical department of an army in the field cover sanitation, professional care and treatment of the sick and the wounded, the provision of medical and hospital supplies, and the collection and transportation of the sick and the wounded. These involve a large amount of executive ability as well as knowledge of the theoretical problems involved. The establishment of regimental hospitals, dressing stations and first aid stations, and the ability to coordinate the activities in the firing zone with the work of base hospitals requires proper organization and training of the highest type.

It is to be assumed that our Medical Department has been alive to its problems and has studiously foreseen all the difficulties that might arise in a medical corps organized to meet an emergency. In countries with large standing armies provision is made for the development of an efficient sanitary corps. With our small first line of defence and our dependence upon citizen soldiers, together with a volunteer army, the problems of medical organization are far more complicated and more difficult to systematize.

**A Report of the Advisory Committee of Civilian Physicians and Surgeons on Medical Preparedness** has been issued. It is part of their suggested plan to carefully select 21,000 doctors to care for a problematical army of 3,000,000 men. Organizations of physicians would be developed in all the states and territories and the nucleus at least of a large medical corps would be estab-

lished. The mere listing, however, of willing volunteers is but the beginning of the work. The difficulties of training in organization, and the obstacles existent in creating opportunity for field experience remain to be overcome.

Plans have been matured for the provision of a number of units to be fostered by the American Red Cross Society. These are drafted from various hospitals in the country in the ratio of 1 unit for each 20,000 men in the field. Supplies are to be gathered and stored to be available for emergency. In actual service they will be under the direct control of the United States Army medical officers. While this represents an excellent plan, there is necessity for acquainting the members of these units with the details of the work to be performed.

Medical schools have been silent upon military hygiene, sanitation, and medicine. Various medical institutions throughout the country might well be selected as centers for the instruction of these units where information can be imparted upon the subjects necessary for the adequate performance of the manifold duties. Similarly, these units should be called out at every militia mobilization in order to have a real experience in the performance of their essential functions, although the excitement and congestion and horrors of actual warfare cannot be duplicated in an instruction camp. Similarly, field schools for medical officers merit further consideration.

It is to be hoped that the present campaign will show that there has been adequate provision made in Washington and that the states have not neglected the sanitary questions so vital to maintaining troops in an effective state of health. With confidence in their integrity, their unselfish devotion, their scientific acumen, we wish

our Army surgeons God speed in their mission. The health and welfare of the troops in the field are in the hands of the Medical Department of the Army. To them, we look for the protection of our citizen soldiers. The battle they have to fight is of greater importance to humanity than are the battles to be fought by the infantry, cavalry or artillery.

#### **Medical Cooperation in Education.—**

The importance of education in medicine daily grows. Similarly, the value of medical cooperation is manifest in educational matters. The Conference of the National Education Association in New York during July evidenced the greater interest of educators in the numerous sanitary, hygienic, medical, and surgical problems involved in school organization and administration.

Departments of Child Hygiene discussed the relation of physical defects to promotion, and problems of home nursing, the importance of medical inspection and co-operation in health administration. The Department of Physical Education gave much time to the consideration of the health of school children, the principles of physical training, and the importance of physical training as a part of national preparedness.

Numerous departments of special education developed the manifold questions arising in connection with the physical care and educational welfare of blind children, deaf children, delinquent children, and mental defectives. Unusually valuable discussions for the first time were devoted to problems of speech improvement in its many relations.

The Department of School Patrons dwelt upon social hygiene and the health of high school children. The American Posture

League devoted most of its program to the relation of posture to health and the maintenance of brain activity, together with the various methods of securing for school children correct posture, so essential for full physical development.

The American School Hygiene Association, which met at the same time, presented valuable programs dwelling upon safety first, medical inspection, mental hygiene, school hygiene, school-house sanitation, oral hygiene and communicable diseases.

The mere tabulation of this list of topics manifests the broad medical nature of school problems. It was at all times apparent that the various agencies now interested in the physical welfare of school children must be called upon for cooperative efforts in order to develop the most effective and rational system of school administration.

There was no suggestion in the discussions as to the advisability of segregating medical activities under a department of education or in the hands of health authorities. It was obvious that the functions of the two departments are complementary and each necessary to secure maximum results.

To find classroom teachers, school supervisors, state commissioners of education, directors of physical training, municipal and state health officers working together to develop harmonious plans for united action promises well for the future. The time for bickerings, disputes, and acrimonious arguments has passed. The large field of endeavor is sufficient to afford an opportunity for educational and health workers to proceed with vigor to evolve cooperative measures for the attack upon their common foes, disease, disability, invalidism, and weakness among the school population.

The entire country is aroused to the im-

portance of the subject and as a result of the last conference, there will undoubtedly be immense gains in every department of physical welfare. The sound mind and the sound body are to be fostered together. The educator and the physician are to walk down the highways of healthful education. They are seeking the safest course for children to traverse in order to arrive at the goal of well balanced development. They, at least, sense the full preparation that is essential before children can assume all the duties and responsibilities of intelligent, virile citizenship.

The example of the National Education Association in securing an illuminating exposition of the medical viewpoint merits more than passing attention. The American Medical Association would similarly be the gainer by seeking opportune counsel and advice, opinion and statement from competent authorities in the educational world. Medicine and education are now too closely interrelated to ignore one another.

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**Immigration and Tuberculosis.**—Hereditv, poverty, alcoholism, occupational hazards, and various diseases have been considered with reference to their dangers as predisposing causes of tuberculosis. They are naturally the most common predisposing causes, but it is obvious that in themselves they do not account for the differences in mortality rates from tuberculosis as reported in various cities of this country. Robinson and Wilson (*Public Health Bulletin* 73, March, 1916) in making a special investigation in Cincinnati of tuberculosis among industrial workers, gave due consideration to these factors, but also made a careful survey of the general conditions which might influence the tuberculosis death rate.

Particularly significant are their observations on the predisposing causes inherent in the character and rate of growth of the population. It is patent that different nationalities have variable degrees of resistance to tuberculosis, and that consequently an influx of a large immigrant population with a relatively high immunity to this disease must necessarily tend to lower the mortality rate.

The Irish, the Germans, and the Scandinavians, in their home countries, have a higher mortality from tuberculosis than the general average mortality from this disease in the United States. What is of greater importance, however, is that the high national mortality from tuberculosis appears to remain with them after emigrating to this country.

The Jews on the other hand appear to have a relatively high resistance to this disease for reasons not clearly understood. The Italians in Italy have a low mortality from tuberculosis, in all probability due to the widespread open air life of the Italian peasant. When transplanted to crowded American cities, they are wont to acquire tuberculosis very easily and succumb very quickly. This susceptibility is more or less offset by the fact that a large proportion tend to return to their native country after but a short stay, during which time they have amassed sufficient funds to enable them to live more easily in their native land. Thus, many Italians, who become ill of tuberculosis in the United States, return to Italy before death ensues and thus do not add directly to the mortality from this disease in their respective American communities.

**The influence of German and Irish immigration** has been shown in the past by the

period of high tuberculosis death rate following the period of immigration bringing the bulk of the immigrants from these nations into our land. Similarly, the falling tuberculosis death rate is coincident with a period of immigration of the Jews and southern Europeans, particularly the Italians. By contrast, it is noted that the tuberculosis rate in England, which has been practically uninfluenced by immigration, has consistently shown a downward course.

It is thus manifest that communities with large German, Irish, and Scandinavian populations will tend to have higher tuberculosis death rates, while those containing large proportions of Italians and Jews from various countries tend to have a lower mortality death rate. These figures, indicating the relation between the constituent national origin of communities, are of immense importance, because otherwise sanitary conditions might be given greater blame for the existence of high mortality rates than is just. With equally excellent sanitary conditions, the difference of mortality rates for tuberculosis would still be existent because of the different degrees of resistance to be found among the various national types constituting the population. For similar reasons, sections of the country or indeed, individual cities possessing a large negro population will necessarily show higher mortality rates than those portions of the community with a low proportion of the negro element in the community.

A second factor, which is of importance in connection with the death rate of a given city, is the rate of growth. As a general rule apparently, the greater the rapidity of increase in the population, the lower is the death rate. The reason is to be found not merely in the excess of births over deaths, but in the number of able-bodied males, who

are the first element to rush to centers reported to be most desirable from the standpoint of commercial success. Such new citizens are naturally more resistant to tuberculosis and thus serve to retard the tuberculosis death rate.

From the economic standpoint, as a rule rapid growth of cities spells prosperity with plenty of work and wages above the average, so that the economic condition of the population is better than in more slowly growing cities. The force of this improved economic condition is patent when one realizes the extent to which poverty induces tuberculosis. The slow rate of population increase therefore becomes a factor contributing to a higher tuberculosis mortality rate.

These facts are of particular importance at the present time when immigration is at low ebb. The opportunities of studying the effect of the disease resistance of various nations upon our morbidity and mortality rates is at hand. It is important for us to properly weigh the effect of immigration on national vitality. More than academic interest is attached to the influence of immigration upon specific problems, such for example as the infant mortality rate, or the tuberculosis mortality rate.

defectiveness. While syphilis may occur in the parents of defective children and the children themselves present a positive Wassermann reaction, to determine definitely that the latter depends upon the former is exceedingly difficult.

In the children studied by Goddard, all of the feeble-mindedness could be accounted for on hypotheses equally good to the single hypothesis that syphilis was the causal factor. To quote his words "If syphilis is a cause of feeble-mindedness, and if syphilis is as prevalent as it is believed to be, can we escape the conviction that the percentage of feeble-minded people would be enormously increased over our present estimate?" In his judgment, syphilis is a general cause of general paralysis, infantile mortality, miscarriages, physical deformities, and abnormalities, but not necessarily of feeble-mindedness. Tredgold found only two and a half per cent of syphilis among children classified as aments.

Goddard tested 81 cases of feeble-minded children of whom 20 gave positive reactions by the modified Noguchi method. Of the 20 positive cases only 5 showed a history of syphilis somewhere in the family. Of the 61 with a negative result 9 had a history of syphilis in the family. Of the 20 positive reactions 9 were classified as belonging to the group of hereditary feeble-minded; 3 to the neuropathic ancestry; 3 to meningitis; 2 were Mongolian type, 2 to accidents before birth, and 1 is unclassified as to cause. From these figures, it is patent that syphilis as an etiological factor is apparently of minor importance. The mere finding of a syphilitic reaction and feeble-mindedness in the same individual does not establish any causal nexus. Both may be de-

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**Syphilis and Amentia.**—In general discussions on feeble mindedness, stress is placed upon the responsibility of syphilitic parentage for the production of much of the mental weakness. Goddard (*New York State Journal of Medicine*, March, 1916) points out the difficulty of establishing the causal relation between syphilis and mental

pended upon the same cause or both may be coincidental in existence but causally unrelated. Nor is it always possible to establish definitely the causal relation by determining syphilis in the parents when mental defectiveness appears in the children. It is always possible that the parental infection was acquired subsequent to the birth of the child with mental defect.

**Parents with syphilis** often have normal children. Non-luetic parents on the other hand may have idiots, imbeciles or morons for offspring. The mere statement "history of syphilis of the parents" is an unsatisfactory criterion as is its denial, unless such a statement is corroborated by a Wassermann reaction. This reaction to afford a probability of accurate determination of causality should be a matter of record at some time preceding the birth of the affected child.

These various difficulties are of more than theoretic value. They are of vital importance in the program for restricting the development of mental defectives. So commonly has it been stated that if syphilis could be eliminated, mental defectives would automatically decline, it is timely to consider the evidence obtainable in order to secure reasonable judgment as to the real part syphilis plays in the production of mental defectives.

To what extent would the elimination of venereal diseases reduce the birth rate of morons, imbeciles and idiots? The answer to this question merits profound consideration and a careful and wide study of institutional records checked up by accurate laboratory findings.

#### **Hay Fever a Type of Acid Toxemia.—**

Perhaps no single disease is the subject of such wide diversity of opinion as to cause, prevention and treatment as hay fever, and the lack of positive prophylaxis or scheme of therapeutics is evidenced by the annual mobilization of the August handkerchief brigade. In proof of this an inquisitive member of any formal or informal conference of medical men needs but mention the condition to elicit tales of blasted theories, futile methods and disgusted patients; but the comfortable knowledge of a large percentage of cures is conspicuously absent. Some disgruntled general practitioner has described the specialist as "an extremist confined in a barrel whose therapeutic visual field, limited by the bunghole, discloses only his particular obsession." That this saw-edged statement carries a modicum of truth is shown by the laryngologist who describes hay fever as a functional neurosis due to many and varied causative and contributory factors of both medical and surgical aspect. An authority on the heart and lungs may speak of hay fever as a possible sequela of a known circulatory or vasomotor disturbance; the gastro-enterologist argues in favor of an intestinal toxicosis, although the latter may be either the cause or effect of metabolic perversion. The general practitioner ascribes his cases to uric acid, and is promptly drowned in the hum of discussion. Here centrifugal force applies and out of the vortex of the verbo-mental whirlwind is projected an occasional descriptive phrase: "angioneurotic edema," "immunization," "pollen," "nuisance," "anaphylaxis," "the mountains until frost." And all the while the sensitized, suffering patient continues to sneeze and develop a cordial hatred of himself and his physician. Yet, despite the painstaking investigations conducted in physio-chemical and pathological laboratories to be later put into practice by

the physician, the true remedy that shall be successful in the large majority of cases is not yet forthcoming.

A thoughtful analysis of the subjective symptoms known to be associated with the onset and course of true hay fever discloses, by the effectual process of elimination, a single entity evidently present in varying intensity in every case: a urine persistently acid to an abnormally high degree. Recent scientific and highly interesting studies in acidosis have shown us the hitherto unappreciated diagnostic and prognostic value, as well as the pathogenic significance hidden in the degree of secretional acidity, and the perfecting of the hydrogen ion and CO<sub>2</sub> tension tests establishes the fact. We know now, that any toxicosis is productive of abnormal secretional acidity with a trend to pronounced acid retention and the inevitable exhaustion of the structural alkaline bases; and that, in terms of the vicious cycle, the degree of renal acidity is in direct ratio to the profundity of the toxemia. We also believe that progressive acidity, with consequent lessening of body and blood alkalinity means a diminution of body resistance and the breaking down of the physiological defenses against disease. Granting, however, that the true etiology of hay fever is still obscure, we do know the pathological phenomena usually associated with it, one of which is surely a urine of corrosive acidity. That this fact has been sadly overlooked but adds to its present value as a new field of investigation. If we agree to these arguments, which are readily susceptible of proof, we must regard hay fever as a new member of the acidosis family, and as such subjected to similar prophylaxis and treatment. Further, if we are to accept the conclusions of such an able authority as Cammidge, who advocates the restoration and maintenance of the normal balance of the alkaline bases of the blood and tissues through selective diet and the administration of alkaline salts in physiological proportion, alkalescence would appear to be the logical treatment. In the light of our present knowledge of the cause and correct treatment of certain baffling diseases grouped under the term of "acidosis" it is only fair to assume that any progressive acidity calls for more than its neutralizing quantity of physiological alkali; and if intensive alkalescence tenders no more than

a supporting hand to the diabetic and nephritic—both true types of destructive acidoses—the victim of hay fever or bronchial asthma is entitled to the proof of its efficacy or failure. It is a growing opinion that through all these years the physicians' armamentarium has held a splendid weapon of defense and one that has been carefully ignored because of its absurd simplicity. Perhaps, had it met with the same intelligent experimental use that fell to the lot of the vaccines and serums that even today have their detractors, a powerful enemy to business and social life might have been defeated, and needless suffering on the part of many thousands prevented.

**A dissection of the arguments for hay fever as a type of acidosis** leads to several confirmatory conclusions. The uric acid premise is substantiated by the fact that concretions have been removed from the nasal and bronchial mucosa of hay fever and asthma patients that were evidently sodium urate formations. It is a known fact that the disruption of the normal ratio of urea output to uric acid excretion is pronounced in both conditions. The etiological possibilities of the intestinal content in acute infectious enteritis must be admitted, in justice to the gastroenterologist, who quotes the prompt effect of hepatic activation, alkaline-saline catharsis and the salicylates in certain acute naso-pharyngeal and laryngeal conditions. The influence of the end-products of carbohydrate and animal fat catabolism in respiratory cases is recognized, and there is a steadily growing conviction that in some cases continuous exhibition of the milk souring lactic acid organisms—but yesterday heralded as a panacea—may produce an acidosis through induced anaphylaxis. The student of blood vessel and circulatory diseases contends that deficient circulation with inevitable diminution of the oxygen supply, in itself a cause of high secretional acidity, may be at once a causative and contributory factor because of the respiratory edema noted. As corroborative evidence he cites other types of edemas such as the angioneuroses, the brain edemas of acute nephritis and eclampsia, pregnancy toxemias and the like, all of which respond to alkaline medication of one kind or another, according to indication. Even

the scoffer who underscores the precision of the onset on a certain date is easily silenced by the factors of fear and apprehension, long known to both the neurologist and surgeon as conducive to lowered body resistance. Fear, apprehension and profound mental shock have led to insanity and even death, and the accompanying relative acidity has been verified by laboratory findings. "All roads lead to Rome" and the relation of abnormal secretional acidity, acid retention, acidosis, or whatever the best descriptive term may be, to the several pathological states to which hay fever may be closely allied, points to the single, broad highway of alkalinity, for if the human organism may be reduced to a state of anaphylaxis by an acid toxicosis, why may not desensitization through body alkalinity, established *prior* to the date of onset and maintained throughout the season, be a possible means to a much desired end: the control of hay fever? Or, in terms of physiological chemistry, and expressing Crile's happy conception of the marvelous adaptability of the human machine, the gradual metamorphosis of the colloid state from hypoalkalinity to normal rests in the simple process of replacing the acid hydrogen ion with the alkaline hydroxyl ion.

**The Field of Prevention.**—The more we study preventive medicine and sanitation, says White, the wider grows the field, until we find that our horizon is almost boundless, being coincident with man's energies and ambitions; and wherever he goes and whatever he does we must henceforth stand by his side and guide him safely. No longer can our efforts or duties be limited by the actual presence of disease entailing the necessity for cure or for prevention of spread. We begin with the cradle, and in ordering the proper diet, clothing, temperature, air and exercise for the young child and watching his eyes, teeth, ears, nose and pharynx, we give him a better start in life than his father had. We follow him through school with the same care and see that he does not overtax his growing muscular system at football, baseball, rowing, track or gymnasium. When he goes into business, it is or ought to be, our duty to see that the office building,

store or factory is built, ventilated and heated aright; to see that the workers in all trades have fresh air to breath, do not work in cramped position, not allowed consumptive fellow workers, have good water to drink, decent privies or water closets, time to eat their midday meals, and not be compelled to bolt them as would a ravenous beast. Such is practical prophylaxis.

**Physical Betterment.**—Impulsiveness in American action is almost characteristic. Numerous reforms are instituted and satisfaction arises at their introduction without a careful program for following up the works instituted to determine their actual value or effects.

For many years medical inspection has been advocated and practiced. Has it functioned in the way that its advocates desire? Have defects decreased? Has health been improved? Are the graduates of our elementary and high schools physically better developed and in sounder health than they were in previous years? Some light upon these questions is afforded by Elizabeth B. Thelberg writing in the *Woman's Medical Journal*, June, 1916.

By a comparison of her records of the condition of girls on entrance to college during the past 29 years, she has arrived at the following conclusions. Spinal curvatures are diminished. Backaches have almost disappeared. Hypertrophied diseased tonsils are rapidly disappearing. There is a tremendous decrease in dental disorders, cervical adenitis, and middle ear disease. Chlorosis in entering students is now almost unheard of. Dysmenorrhea has decreased remarkably, as well as amenorrhea and irregularities. Even chronic constipation is strikingly lessened in frequency. The various neuroses are slowly vanishing. Organic heart diseases are less frequent. From this brief enumeration, it is beyond conjecture that the various forces constantly at work throughout the country for the purpose of improving the physical welfare of school children are achieving success.

The adolescent girls entering Vassar College are but typical of girls entering into our various institutions for higher education. Their physical welfare has been bettered by the supervision, advice, and in-

creased intelligence which it has been their good fortune to encounter and enjoy.

The educated parenthood which is slowly developing is expressed in more sensible feeding, dressing, and exercising of children. The customs and habits of this generation are immeasurably superior to those of a generation ago in the light of personal and public health. These potential mothers, possessing good health and appreciative of its advantages, constitute a valuable leavening power for the education of their associates in the future.

One striking fact which is presented by Dr. Thelberg is worthy of further investigation. Goitre appears to be more frequent than in the past. While it is probable that many of the goitrous conditions are physiological, the increase in exophthalmic goitre cannot be accounted for on this basis. The actual percentage of goitres in her experience has increased. Those in charge of girls during adolescence should be able during the next few years to verify or dispute these findings. Thyroid function is known to be an important factor in the general functioning of the body. It has been recognized that the geographic distribution of goitres is of considerable importance when endeavoring to determine the particular factors entering into its pathological development.

The fact that this single condition is apparently the only one recognized as on the increase among the freshmen at Vassar College is indicative of the importance of directing greater efforts to the recognition, correction and prevention of this defect.

favors the establishment of nerve-weakness, but with it brings cardiac and muscular asthenia, hypotension and an inability to respond to many of the normal stimuli which control the numerous functions of the body. This being the case the removal of worry and fear should be the rational treatment of hyposthenic conditions and, too, when the adrenals are depleted and these nervous manifestations are aggravated, it would seem that the administration of an adrenal preparation of some kind might be a rational procedure.

In this connection some epigrammatic remarks by W. S. Sadler are worth repeating:

"No first class stomach will do good work if you spy upon it."

"It is well to know where the fire-escape is, but don't lie awake all night smelling smoke."

"Thunder is the bark of the dog that never bites."

"Get your mind off your thoughts."

In many functional nervous disorders earnest reassurance by the medical adviser, a new range of surroundings and things to think about and a change of air will accomplish more than all the drugs in the pharmacopoeia. We have been depending too much on the tonics and sedatives and too little upon Nature. After all the doctor is merely Nature's assistant.

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**A Telephone Probe.**—A radical departure in surgical technic through a device known as the telephone probe has recently come into use in England (*Lancet*, May 1, 1915). It was primarily designed to locate the presence of bullets or pieces of shrapnel in wounds, or any foreign metallic substance in the human body. It consists of a silver rod insulated from a sheath of the same metal, forming the two electrodes. They are attached to a plug by insulated wires encased in rubber tubing. In the lid of the box are fixed the plug holder, a specially wound telephone, and a dry cell of the ordinary flashlight pattern. The latter, when exhausted, can be replaced at a nominal cost. When the plug is in its holder an electric current is established on inserting the probe into a wound, contact between the rod and sheath being effected through the moist surfaces. Any disturbance of the

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**Fear as a Cause of Nervous Disorders.**—Whether morbid fears can cause organic disease may or may not be an impossibility, but that "giving way" to worry, fear or morbid thoughts is a frequent cause of neurasthenia and the numerous allied conditions, is admitted by every medical man or woman. Just how this is brought about and what physiologic factors were concerned in the translation of worry or fear into functional neuroses has not been well understood. Now comes Cannon and explains that these changes result from undue stimulation of the adrenal glands with a resultant hypoadrenia which not only

flow or interference with the lines of force of the current, such as occurs when a piece of metal is touched by the probe, will be instantly indicated by an audible noise in the telephone. The apparatus is simple and efficient, and can be used by any one. There is no complicating adjustment of parts to either patient or operator. The noise in the telephone is audible to quite a distance. The probe can be used as any ordinary surgical probe; can be bent in any manner and sterilized by boiling as needed. There does not seem to be any reason why the apparatus could not be adjusted to a pair of forceps.

According to R. G. Canti in the same journal and same issue, a telephone probe may consist of a telephone receiver, one terminal of which is electrically connected with the skin of the patient by means of a flat electrode covered with a wet cloth, the other terminal is connected with a metallic probe. A dry battery may be used although not necessary. The probe is introduced along the tract of the bullet; on contact with it or other metal, even a small piece of a needle, a sound is produced in the telephone, by resistance of the current. If the area of the metallic substance is large, the resistance will be low and the sound in the telephone loud; if small the sound comparatively weak.

All parts of such an apparatus which come into contact with the tissues and the surgeon's hands, should be made easily detachable and of material which can be easily and safely sterilized.

The source of the current in this apparatus need not be a battery, but be generated at the area of contact of the body with the electrode, which can be made either of metal or carbon. Much louder sounds, however, can be obtained and much smaller pieces of metal located by using dry cells.

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**A Question and Answer.**—The educational opportunities of the press are being recognized in the field of hygiene. Some of the queries and answers by physicians, which are given much space in the papers, at times reflect a lack of information on the part of the doctor or an attempt to be non-committal and at other times are suggestive of indefensible fears.

The following quotation of question and

answer carries its own lesson. To read it is to wonder. To read it twice is to wonder still more. To read it the third time leaves one in the same state of mind.

"A reader inquires: Would the fact that the father died of tumor on the brain and that the mother has suffered a paralytic stroke affect the health of their daughter or her children? Is either hereditary?"

#### REPLY.

"No. However, if your people are prone to apoplexy your chance of going that way when you reach the apoplexy age is good. People belonging to apoplexy families should avoid from childhood up, high living, overeating, constipation, drinking alcoholics, using tobacco, lead poisoning and venereal disease. The fewer attacks they have of rheumatism, colds, bronchitis, measles, diphtheria and scarlet fever the less the probability of apoplexy at sixty."

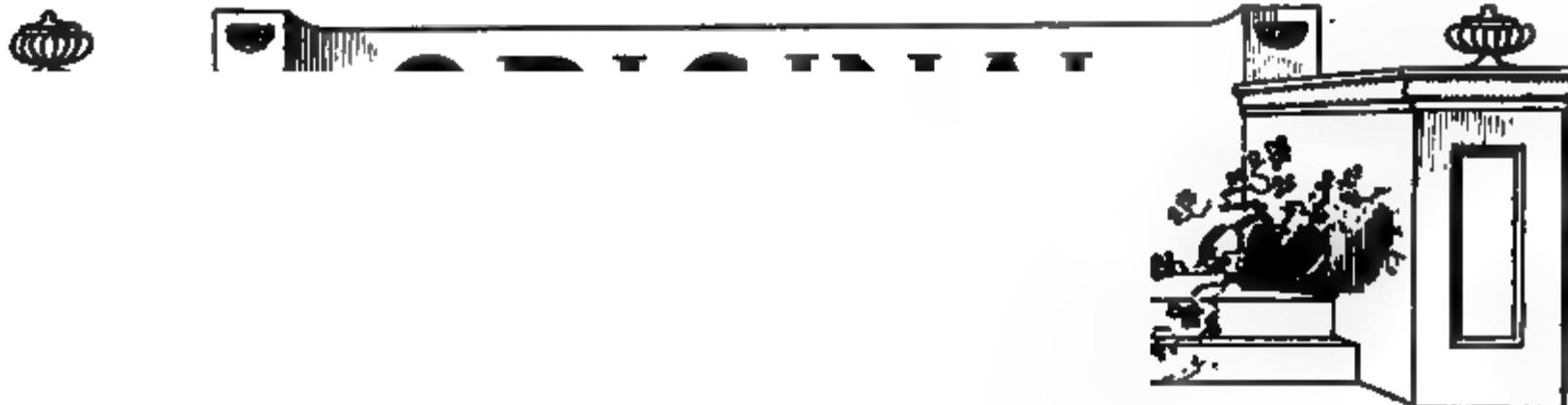
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#### Tonsillectomy in Diphtheria Carriers.—

In a recent issue of the *Journal A. M. A.* (March 11, 1916, p. 810) Friedberg recommends the removal of the tonsils and adenoids, if present, in diphtheria carriers. He reports six cases in which these procedures were carried out. We strongly disapprove of such radical measures when it is proved that the tonsils are either not diseased or are not affected in the degree usually considered to be indicative of operation.

There are other effective means which should be tried first. We have already mentioned the efficacy of lactic acid bacilli in previous issues of AMERICAN MEDICINE, and elsewhere we have abstracted an interesting article on the value of applications of iodized phenol to destroy the diphtheria bacilli. Surely such simple local measures should be used before recourse is had to the radical removal of the tonsil.

While it must be admitted that the tonsils are often the entrance of infection into the system and tonsillar disease is extremely common, we still subscribe to the idea that they have a well-defined function and to remove them more or less indiscriminately, despite the fact that they may be slightly enlarged and harboring offending organisms in their crypts, should only be considered after the other measures have been thoroughly tried and have failed.



## "MILITARY SURGERY AND THE SURGEON IN THE PRESENT EUROPEAN WAR."

BY

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To a physician first visiting the battle front after serving in a large base hospital, is presented an entirely new phase of surgery, absolutely different from any of his previous teachings or experiences. In a war such as we have today, where there has been continuous fighting for months without an armistice, all his carefully planned and marked-out ideas of "first aid" are shattered, for he finds that the dead and wounded soldiers can only be removed at night from the field of action by stretcher bearers, and that when this is accomplished, the motor ambulance cannot take them to the field hospitals, because by showing lights they would draw fire. Many unfortunates, therefore, are forced to lie outside the lines unaided for hours, sometimes days and weeks, in the wet mud of manured fields until their torn trousers, clothes and wounds are so soaked in a mixture of blood and dirt that it is often impossible to get the wounds clean.

The bullets are in many cases of the dum-dum type, and fired at close range, sometimes but a few yards apart, produce a

most explosive effect. The limb is often so violently contused by the mass of jagged metal tearing its way through all the tissues that large portions slough away.

The "Hilfsplatz" is the first place the soldier reaches when carried from the field. It is usually located in some available building such as a railroad station, barn, town hall, or church. Here he receives his first attention. The heavy cases are assorted from the light ones and are sent to the "Verbandplatz," lazarettes or hospitals further behind the line, and of better equipment.

**To Prepare the Wounded for Transportation.**—First they must be cared for so that the surgeon may be sure that no harm or accident will come to them en route. Broken bones should be set or made immovable, by placing them, regardless of complications, in plaster of Paris casts, if you are fortunate enough to possess any, or splints, which are often necessarily improvised: limbs of trees covered with straw, iron bars on which is wrapped a coat; a rifle or gun securely strapped beneath the thigh or limb gives entire satisfaction. Light pieces of board are of most value, but such a splint may not be available, and your natural resourcefulness and ingenuity are taxed to the utmost. The following list of extraordinary possibilities may suit the purpose: bayonet, sabre, scabbard, bundle of twigs; various tools, such as a hammer, foot-rule, chisel, saw, broomsticks, shovels, any metal rod or bundle of rods; straw cases for bottles, stuffed one inside the other, metal pipes, such as water spouts and boiler tubes; bamboo of various sizes and shapes, newspapers wrapped up as they came from the post; cardboard box covers, and books, packing

paper, old wooden boxes, and leather hose, boots and leggins; linoleum wrapped about the limb, old tin cans flattened out, wire netting wrapped to a suitable thickness; stockings filled with sand, earth, hay or paper;

wrapped completely around him and the stretcher and fixed with a pin, as a last resort. An excellent plan in the case of a fractured lower limb is to tie the two limbs together, thus making the sound one act as a splint for the injured one.

When I speak of military surgery, I refer to a surgery differing from ordinary every-day surgery, in that the injured are pressed upon the surgeons in such numbers that they are not physically capable of meeting the demands placed upon them. In the field the "open sesame" to success is to work as simply, quickly and surely as possible, dismissing the wounded that you cannot keep under your care, in such a condition that they may be transported further without danger from any possible accident. Losing sight of the great majority of his cases, the military surgeon lacks any self-criticism of his results.

The wounds may differ according to the kind of projectile, and according to the effect produced. The first involves infantry bullets, shrapnel, pieces of grenade or shell and bayonet wounds, each one of which must receive its own characteristic treatment, the only two rules applicable to the treatment of them all being cleanliness and conservativeness. The entire work of this branch of surgery comprises: 1. First aid to the wounded. 2. The final care of the wounded. 3. The after treatment. The first aid consists chiefly in stopping the hemorrhages. Here the consistency and quality of the ligatures used are of the utmost importance. Small, sterile, double-quality, gauze bandages, if supplied to each soldier, may be applied in the field by a comrade and will give excellent results. To this first division also belongs the prevention of sepsis. I find this best combated by the immediate application of tincture of iodine 25 per cent. by the soldier him-

FIG. 1.—Pole who has received wounds of skull, brain, shoulder, penis and scrotum and both feet. Almost completely recovered. Hospital of 4,000 beds in charge of Dr. E. Kilbourne Tullidge.

pillows firmly placed about the broken limb; sandbags, slates or flat stones, halves of flower pots, gratings, cask-staves, umbrellas, walking sticks, billiard cues, telescopes, stiffened felt, basket work, telegraph wires bent the desired shape, paper knives, tightly rolled-up carpet or canvas. In fact, anything that is firm and long enough to keep the joints immediately above and below the fracture at rest. You should, of course, make your choice of something stiff, light and flat, with bevelled square edges and sides. If no suitable splints can be obtained, you should, as additional security, bind the patient to a stretcher with a sheet

self or by his comrade. To them it should be supplied in small, one-ounce phials with a constricted neck, and wrapped in a gauze or cotton binder to prevent its loss when the phial is broken. The contents should be immediately emptied into the wound regardless of its character, and the pad applied. In experimental treatment of 50 cases in this manner, I found that 46 escaped the severe phlegmonous involvements usually complicating shrapnel wounds, although they suffered from an inflammatory edematous condition that results from the irritation and absorption of the iodine tincture.

The most difficult of all the cases to treat are the large and complicated fractures of the thigh and leg, especially those of the former. These practically all presented great phlegmonic infections involving large sections of splintered bone, which, if removed, left a gap of several inches between the ends of bone from which repair could be expected and callous formations develop. On the other hand, if these detached splinters and fragments were allowed to remain, a large tedious process resulted, accompanied by great amounts of discharge, not only from the infection of the wound itself but from these pieces of bone that gradually died and sloughed away or became chronic sequestra around which new bone formed or tissue developed. From the reports and results of other hospitals, 38 in number, I found that on the average from 50 per cent. to 65 per cent. of these cases ran a bad prognosis because of the frequent involvement of the knee and hip by burrowing pus, and because of the inability of the patient to withstand the terrific drain upon the system caused by the necessarily long confinement. Many of the soldiers died from exhaustion that I am

sure would have recovered if amputation had been resorted to soon after the wound occurred, and when the patient's systemic condition was at its best. However, amputations have been, from my observations in the Austrian army, the most commonly performed operations—common to the point of unnecessary abuse. Simple, quick, and giving a certain amount of relief, many of the doctors, I am sure, performed an amputation in preference to taking the trouble, and at times the exasperating experience

FIG. 2.—Left—Shrapnel wound of face, involving eye, ear and antrum.

Right—Wound and fracture of arm. Arm put up in extension apparatus devised by Dr. Tullidge while serving in Austrian Army.

of properly applying a splint, or plaster of Paris cast. However, when of absolute necessity, they are best made by a circular incision of all the tissues, including the bones at the same level, the lowest possible one. The skin is divided by a circular sweep; the muscles are cut at the level to

which the skin retracts, and the bone is then sawed through at the same level. The bleeding points are secured and tied; the nerves and tendons pulled down and cut short, and a dressing applied to the raw surface of the stump. It is absolutely inadvisable, and impossible, for any length of time, to close with sutures an infected stump, as 95 per cent. of them are, because the sutures soon slough away or are absorbed by the discharges. The advantages claimed for this method are: 1. Economy of tissue, it being performed at the lowest tissue level. 2. It is applicable to otherwise hopeless cases such as wounds at the

carefully: 1. Rapid loss of strength, giddiness and faintness. 2. Pallor of the face and lips. 3. Breathing hurried and labored, accompanied by yawning and sighing. 4. The pulse is very weak and may be absent altogether at the wrist. 5. The man throws his arms about, tugs at the clothing about the neck and cries for air, finally becoming unconscious.

The first thing that you should suspect when you find a man unconscious on the field without external injury or sign of gunshot wound, is internal hemorrhage. The quickest and safest method to treat these cases is that of raising the feet and

FIG. 3.—Fracture of bones of lower arm from shrapnel.

roots of the limbs, and carries a better prognosis than disarticulation at the hip and shoulder joint. 3. It is quickly performed, with little shock. 4. Only the least possible surface for septic absorption, with plenty for free drainage, is presented. 5. The nutrition of the stump is unimpaired. 6. It is simple and can be easily performed even by inexperienced surgeons and helpers.

**Internal and External Hemorrhages.**—Internal hemorrhages are often the result of shock, wounds of internal organs or indirect injury. It is of great importance to recognize this complication, and the following signs should be studied and watched for

bandaging the limbs firmly from the toes to the hips, and from the fingers to the shoulders. Blood issuing from the ear should be wiped away as it issues, no attempt being made to plug the ear.

Abdominal wounds are rare when comparing them with the frequency of fractures, but cause extreme collapse and vomiting of dark blood. The liver, spleen and kidneys, also the intestines and bladder, are injured by blows, bayonet stabs, bullet or shrapnel wounds, and even by fracture of the lower ribs when involving the liver and spleen. An ice-bag tightly packed with snow, which is frequently used, over the

seat of the injury, melted snow or ice to drink by mouth, and a tight abdominal binder, is all the first aid treatment possible on the field.

External bleeding, particularly arterial

wipe the blood away and, if any foreign bodies are found in the wound, hurriedly and quickly remove them if possible. You will now see the injured artery or its whereabouts. With your thumb or finger

FIG. 4.—Fracture of clavicle, and bullet wounds due to shrapnel.

bleeding, is of paramount importance, and when it is suspected, you must act rapidly and keep your head clear. First remove the clothing, hold the wound open in a good light, scrape away the blood clots, rapidly

control the flow by direct pressure. It may be suggested that if your finger be dirty you are endangering the patient by perhaps infecting the wound. Let me state, that at such times, and in such cases, it is far bet-

ter to take this chance than to waste time and life. Indirect pressure is the next thing to accomplish, and can be made by a strong handkerchief rolled up into a broad band tied around the limb next to the body, and screwed up with a stick. By placing beneath this band a pad, directly over the

be slackened and allowed to remain loose about the limb in case of emergency. It is at times difficult to tie a tourniquet properly, and it is therefore advisable to have an assistant tie the knot while you hold the pad in place, making sure that it will not slip.

The question of the control of hemorrhage is a most serious and difficult point to deal with, both on the field and in the hospital. Wyeth's mattress needles and tourniquet are brutal and impracticable in the first instance, and unnecessary in the second. We have therefore: 1. The elastic tourniquet. 2. Preliminary ligation of the artery, which is also impossible to use on the field. 3. Senn's method. 4. Ligation of the artery during amputation, which was largely used. 5. Digital compression of the artery or its main root above the amputation site. 6. Digital compression of the artery in the flap, as cut, usually performed in the femoral artery.

Of the above methods, the elastic tourniquet, ligation during amputation, and digital compression, are the best and most advantageous. It requires not only skill but thorough knowledge to quickly and correctly apply the ordinary rubber elastic tourniquet. To use it upon the thigh, the limbs should be first elevated by an assistant to a vertical position and held thus for a few minutes. Further aid the emptying of the limb by downward massage. A pad is placed over the external iliac artery, rubber tubing about five to six feet long is passed around the thigh in several tight turns over the pad. The center of these turns is placed between the tuberosity of the ischium and the anus, bringing it up so as to pass over the center of the iliac crest. At the point of crossing, an assistant with the back of the hand (the right hand for

FIG. 5.—Fracture of humerus due to shrapnel.  
offending vessel, we have thus formed a tourniquet. This pad may be simply a piece of cord, potato, carrot, onion, pebble or stone, a piece of wood, rolled-up bandage, or whatever may first present itself. At the end of half an hour the tourniquet should

the left side, and *vice versa* to the patient's body), grasps and holds the crossed rubber band. Or the two ends may be carried around the trunk and brought back again to make a second similar ring. The two ends are then tied or clamped above the center of the iliac crest. The anterior part of this tourniquet, running above and parallel with Poupart's ligament, compresses the external iliac under the pad, the posterior part running across the great sacro-sciatic notch compressing the gluteal, sciatic and internal pudic arteries.

because of the necessity to daily remove them when dressing the wound, thus disturbing the continuity of the bones. Iron hoops, devised by Prof. Hochonegg of Vienna, were absolutely out of the question in badly complicated fractures of the arm, and I was thereby forced to devise a splint that would: 1. Keep the bones in apposition and constant extension. 2. Allow daily irrigation and dressing of the wound without disturbing the extension of the bone. 3. Be itself constantly clean and free from wound discharges.

FIG. 6.—Fracture of lower arm due to shrapnel.

**Wounds of the Arm.**—Wounds of the arm with complicated fractures were of the most concern. Although extension was absolutely indicated, it was almost impossible to obtain any permanent extension, because of the lack of proper apparatus for the purpose. The Gibb's plaster of Paris cast was very unsatisfactory because of the large quantity of the discharge that kept the coat constantly in a filthy, moist, bad-smelling, offensive condition. Ordinary splint extensions were also discarded as invaluable,

The first splint consisted of a narrow iron strip, bent at both ends to form slight angular arms at either extremity. These fitted respectively over the shoulder and beneath the flexed elbow, extending out beyond and away from the arm for about three inches at either end. The lower end was fixed to the forearm with pads of adhesive plaster, while the upper was slipped beneath a tent-like, triangular-shaped band the ends of which were attached securely, anterior and posterior, to the clavicular

deltoid and the skin over the scapular region. The iron strip being some three to four inches longer than the arm, a permanent extension of the bone was produced, which permitted daily irrigation and dressing without interfering with the extension.

The second splint or apparatus gave results that I was unable to obtain from the first. It is, however, similar to the first one, but less easily constructed. It consists of two sliding parallel bars connected by circular rings or bands, and having at either extremity flat rods which, unlike the first splint, worked upon a pin, and were

the advantages of freedom, open air and sunshine.

From the observation and treatment of many cases, I find that of the total number of wounds, those due to artillery projectiles, viz.: balls, fragments of shells and shrapnel, form a large proportion. Of 2,825 cases in which the origin of the wound could be determined, 1,490 cases were caused by artillery projectiles, 1,120 by bullets, and the remaining 224 by bayonet stabs. The frequency of fractures is exceptionally great, practically three-quarters of the cases presenting some bone involve-

FIG. 7.—Fracture of ulna due to bullet.

adjustable to any angle desired. These rods were attached to the shoulder and forearm by circular, tin plates, secured by lacing them up, or by bandage. When both ends were made fast, the bars, which extended about three inches from the arm, were forced apart until the desired extension was obtained, and were fastened by an eight-shaped ligature connecting the curved hook on each bar for the purpose.

With these splints or extension devices, the dressing could be removed daily with every convenience, and the wound irrigated and inspected. The patient is not confined to bed, and may have

ment, there being 1,839 fractures in the above 2,825 cases. Unlike ordinary fractures, gunshot fractures are distinguished by extensive splintering with the result of numerous fragments. In limbs with two bones the lesion is generally limited to only one, although both are often shattered. I found it necessary to distinguish between soiled and unsoiled fractured wounds and thereby place the latter in the conservative class, while the former received immediate treatment of a more radical nature. The mortality was greater in those cases that arrived from 56 hours to 15 days after the battle, being in some sections or localities as high

as 20 per cent. to 30 percent., owing to the serious complications of tetanus and gas gangrene. This high mortality could have been avoided, I feel sure, by suitable treatment in the first field hospitals or by proper facilities for transportation. Shrapnel bullets and bits of grenade, with their ragged edges, often carry pieces of clothing and foreign bodies into the wound because of the slight force with which they reach their mark. In from 80 to 90 per cent. of cases, these wounds result in suppuration. As a rule, however, the simple wounds of the soft parts inflicted by infantry bullets pursue a favorable course, and in many instances, those who have been struck by these bullets are fit for service in the field a few days or a week later. In treating these wounds, I applied, locally, tincture of iodine to both the avenue of entrance and exit, and dressed them with sterile gauze and bandage. The temperature ran a hectic course for the first four or five days, and then dropped back to normal where it remained, the patient leaving his bed in the course of a week to return to service.

Non-complicated joint wounds from infantry bullets also pursued a favorable course if splints are applied and mobilization practised at the right time.

It is surprising how quickly the most atrocious gunshot wounds will recover: even wounds of the spinal column appear to afford a very favorable prognosis. The extent of the injuries that a soldier can overcome depends principally upon his general constitutional condition at the time the injury is received. A large number of those injured by rifle bullets have absolutely clean wounds. These are often small, non-lacerated and non-infected. If the general condition of the soldier is good, recov-

ery is rapid; but if, as sometimes occurs, the facilities for personal cleanliness are practically nil—for the average soldier's clothing after a six-months' campaign in the field, is in a frightfully filthy condition—recovery is rather slow and tedious. The latter lack of cleanliness is probably the greatest factor in infecting wounds; for a shrapnel casing or a soft bullet traversing such clothes is sure to, and does carry with it, deep into the wound, particles of torn, ragged, filthy clothes, which are extremely hard to find, and often remain imbedded there as an unknown seat of sepsis for a long period of time. The wounds from shrapnel are, as I have said before, the most severe and give the most difficulty. They result from the bursting of a large ball-containing casing (each ball about 50-caliber or from thirty to sixty to the pound) which, when it explodes, scatters in all directions in the so-called "zone of dispersion." Thus you may find large and small particles of lead casing or other bits of its composition, which, travelling at a comparatively low rate of speed, cause large lacerating wounds containing bits of clothing and equipment.

A most interesting case was one in which we extracted a circular disc of iron resembling a small wheel, but which was part of a shrapnel imbedded securely into the bodies of the upper sacral vertebra, where it had lodged for three weeks. The only symptom was a constant, dull pain in that region radiating down the posterior aspect of the thigh. It required two surgeons to dislodge it without chiseling away the surrounding bony structures. The patient recovered, but developed, sometime later, a disturbance in his sphincter reflexes. "Phlegmons" are complications frequently met with, in fact, are more or

less common, and are best treated by large incisions. Fear should not be a factor in laying open such a wound. Irrigate it first with hydrogen peroxide, remove all loose fragments, splinters or foreign bodies, and pack the wound, the whole limb if necessary, for the first two or three days with frequently applied hot sublimate dressings. The temperature will come down. I have never had a case fail to do so. When this occurs the limb may be placed into a continuous bath of warm borax, weak potassium permanganate sublimate, or warm, clean water containing a little common table salt, or into which may be allowed to run from a tank alongside of the bed, carbon-dioxide gas. In this last treatment I did not find a plausible benefit that could be derived from its practice. However many claim it of help and benefit and persist in using it without increasing their percentage of recoveries.

In large hospitals where many, in fact every case has some specific infectious process, it is surprising how easily secondary and inter-infectious phenomena may develop. Because of this, and the great and various number of cases of necessity dressed every day, I found it of great advantage, help and necessity, to adopt and enforce a similar code of instructions and rules as those set forth by Charani, in his excellent work on "Treatment of Wounds in War" for use in the hospital. They were as follows, proving of great value and saving many lives and much trouble:

1. Around the edges of each wound when dressed must be applied *ung. zn. oxid.*, to keep out extraneous infections, stimulate cellular activity and soothe the irritation arising from long and constant periods of dressing.
2. Dressings when removed from the wound, must be immediately thrown into a receptacle for that purpose, and not upon

the floor.

3. A 1-500 solution of potassium permanganate should be used as a deodorizer.
4. Bandages must not be made in rooms containing sick or wounded.
5. All wounds in casts must be open for inspection every three days, and the date of the last inspection written plainly on the outside.
6. The constricting bands should be left in place not longer than one hour, and direct compression must be used to stop hemorrhage.
7. Suppurating wounds must be dressed each day and all arising complications reported immediately.
8. Pictures and diagrams must be drawn and accompany each and every chart showing the exact Roentgen findings of the case when possible.
9. Casts must contain on the outside, name, date and hour applied, exact diagnosis of the injury beneath, and must be signed by the attendant in charge.

The relative frequency of injuries to the various parts seem to balance in favor of fractures of the extremities, particularly the forearm and leg, although the head, hip or thigh and thorax must receive some consideration.

**Injury of Thorax and Ribs.**—Of all the wounds, those of the thorax and lungs are the most discouraging to treat. A shrapnel bursting may carry away the whole side of the chest leaving only fragments protruding from the lung; or it may merely fracture one or more ribs driving small splinters into the lung, often with little or no outward deformity when this latter happens. The pain will in every instance remain localized and can be mapped out with ease. Hemoptysis, pneumothorax, hemothorax and hydrothorax are common complications. The sternum and manubrium are often involved, and often the gladiolus is completely destroyed or carried away. Both lungs may be pierced by a single bullet that passes completely through the chest, emerging from the body at the opposite side from the entrance, leaving a small, sterile wound that quickly heals if the ribs are strapped

with adhesive and the patient placed in a semi-upright position.

The more extensively involved cases before spoken of, are almost hopeless, and, other than stopping the hemorrhage by packings of gauze and lint and administering morphine hypodermically, nothing can be done. The fragments, if removed, are so deeply imbedded into the lung proper that great hemorrhages invariably accompany their extraction. These are sometimes impossible to check and death follows shortly.

#### **Injuries to the Abdomen and Spleen.—**

Prof. Kausch of the German Army told me while in Galicia that he had found it possible to determine whether or not the intestines or other abdominal viscera had been injured, by the presence and recognition of free air in the abdominal cavity. He makes a very small incision in the abdominal wall, preferably through the rectus muscle, under local or general anesthesia. The peritoneum is punctured and if air escapes under pressure, the wound is enlarged and laparotomy is performed. If not, the wound is closed and the patient placed aside until further developments arise. In wounds of the intestines I found this a valuable diagnostic method in 160 cases; but when other viscera were involved it was not dependable and of no significance.

Wounds piercing the intestinal canal are invariably fatal if attention is not received during the first 24 hours; or preferably and with better results, (40 per cent. better), upon the field a few hours afterwards, not far from the place of injury, thus preventing complications that are sure to arise and probably prove fatal, because of improper and inadequate transportation. Circular purse-string sutures about the in-

testinal perforation, inverting the edges and whipping the approximated surfaces together with Lembert sutures will suffice to produce good results and often uneventful recovery. Fluid in the abdominal cavity accompanying peritonitis should be sponged out with dry, sterile gauze and the belly walls closed without drainage. One of the most remarkable features of war surgery is the number of uneventful recoveries among the soldiers suffering from abdominal wounds complicated with peritonitis—if they receive prompt, early and efficient treatment.

It is a rather interesting fact that amongst the many abdominal wounds inflicted during the fighting to date, comparatively few have involved the spleen or pancreas. The condition of traumatic injury of the spleen is so seldom met with in ordinary circumstances that I believe the three cases coming under my care to be of sufficient importance to cite here. The first was a boy of 20 years; former occupation, farmer. He was brought into the station in a state of extreme shock, a small thready pulse, lowered condition of respiration, blanched skin and mucous membranes, skin cold and clammy, muscles relaxed, eyes sunken and dull, with dilated pupils; mouth half open, diminished sensibility and sub-normal temperature. Examination disclosed a bullet wound of the left side, entering the interspace just below the tenth rib, about one inch posterior to the mid-axillary line, coursing upwards and outwards, piercing the diaphragm and lower extremities of the left lung to make its exit through the sixth interspace. Because of the vast amount of blood flowing from the wound and the condition of the patient, immediate operation was decided upon and splenorrhaphy performed by oblique sub-

costal incision. The organ when exposed was found to be greatly swollen and torn in several places and of reddish-black appearance. The thrombi or blood clots that had formed about its surface were wiped away and chromic catgut, interrupted sutures on a large, round curved needle, were carried through the broken edges, dipping deep down into the substance of the organ, which was very soft and difficult to handle. The surfaces being brought together, the abdomen was closed and the cutaneous sutures painted over with tincture of iodine. The diaphragmatic area, and that surface immediately covering the wounded lung, was securely strapped by bands of adhesive plaster, extending from the mid-line of the body anteriorly to the vertebra of the spinal column posteriorly, and from the sixth interspace down to the twelfth rib. Recovery was rapid and the patient was able to leave his bed in the course of 12 days.

The second occurred in a man, aged 40 years; occupation before the war, miner in one of the great salt mines of Poland. He also suffered intense shock, but recovered in the course of two weeks after the bullet had been removed from the spleen, where it was found to have lodged. The third case was due to a shrapnel explosion, complicating also the splenic flexures of the colon, the left kidney, the tail of the pancreas and the first and second lumbar vertebrae. Four distinct operations: splenorhaphy, nephorrhaphy, pancreateorrhaphy, and a circular purse-string closure of the splenic flexures were necessary under the one anesthesia, the abdomen being closed without drainage and recovery taking place in the course of three weeks.

The pelvis, as the other bones in the body, may be fractured in every conceivable

fashion. The crest may be chipped off, carrying with it the anterior superior spine and bits of the sacral vertebra. The ilium may be splintered involving the sacrum. The pubes and the ischium may respectively become involved complicating the bladder, ureters and rectum, as the case may be.

One patient, a man 40 years old, received a wound entering the gluteus maximus just below the superior spine, coursing through this muscle, missing the spine of ischium, traversing the rectum and making its exit through the posterior fold of the buttocks on the opposite side of the body. There was no pain whatever, the only sign and symptom present being a slight discoloration of the scrotum. I carefully washed and dressed the wound on the morning of its arrival at the hospital; first ordering, as a routine practice, a high saline enema. The rectum and anal orifice were plugged with clean, sterile cotton. The following morning the attendant on duty in the ward surprised me by stating that the patient had died during the night from causes unknown. An examination disclosed an enormous hematoma of the scrotum, the result of internal hemorrhage due to the erosion of the internal pubic artery or one of its branches by extension necrosis from the wound.

#### **Wounds of the Penis and Scrotum—**

It was surprising how frequently the penis was the seat of gunshot wounds. Usually, however, and fortunately, the thighs on either side were the only other parts affected or involved. In 20 cases I found six in which the organ had been so mutilated and unrecognizable that partial or almost complete amputation was necessary. In seven cases urethrotomy was necessary after the primary wound had healed, and in the remaining urethrorrhaphy or suturing of the urethra was found necessary.

This is done by passing a metal sound or soft catheter through the urethra, care being taken not to increase the wound. With a curved needle and fine catgut—chromic is preferred—the opposite edges of the torn urethra are united by interrupted or continued sutures passing through the entire thickness of the wound except the mucous membrane, approximating the edges of the urethra and allowed to remain there from four to six days, when it may be removed with a surety that no urinary infiltration will occur.

The scrotum and testes were also occasionally wounded, the latter usually complicating the former. Consisting as they do of the testicles proper and the epididymes, which is the beginning of the vas deferens, bullets passing through or lodging in them caused considerable pain, swelling and inflammation, with epididymitis and the not frequent necessity of unilateral orchiectomy.

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## THE COMMUNICABILITY OF POLIOMYELITIS.

BY

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Poliomyelitis is again evidencing its epidemic ravages. New York City is undergoing a severe strain owing to the extent of the outbreak and the unusually high mortality of the cases reported. The Department of Health with alertness and vigor has pursued a campaign to limit its spread and restrict its development in other sections of the community. The effectiveness of its control is limited, however, by a lack of accurate knowledge as to all the elements entering into the transmission of the disease.

Considering that the victims of the disease themselves constitute foci of infection and that carriers abound who are likewise sources of danger to the community, one cannot help asking the question in how far has the New York epidemic been affected in growth or virulence by the numerous sanitary measures employed, by the hospitalization of cases, by the isolation and quarantine, and by the unusual exercise of the police powers of the health department.

It is recognized beyond question that the general sanitary regulations which have been enforced are of general service to the community in the prevention of all diseases. To what extent, however, this has been of specific assistance in the limitation of infantile paralysis is a subject which it is to be hoped will be made clear from the epidemiological investigations which are forming an important phase of the present campaign against the disease.

The plan of hospitalization centrally organized is new. There is much to be said in its favor as an excellent instrumentality for securing isolation and control of those infected and actually suffering from the disease. In the epidemic of 1907, however, children with poliomyelitis were received and treated in all the general hospitals, though no special effort was made to secure the actual control of all the victims. It is of the utmost importance to appreciate that despite the admission of sufferers from infantile paralysis to the general wards of hospitals, no secondary cases arose in any of the institutions among children or adults. There is an inherent danger in herding together a large number of young children in hospitals owing to the possibility of engrafting a second epidemic upon the primary one. The possibility of an outbreak of scarlet fever, measles, vaginitis, and similar con-

tagious diseases is not entirely negligible and warrants consideration in connection with the entire plan.

In the face of an extensive epidemic, where the period of quarantine is to be continued for six weeks, there is every possibility of all hospital beds being exhausted with a resultant exclusion of many sick persons whose ailments demand hospital attention in order to secure the best treatment: If it is not possible to make room for all the victims of infantile paralysis, a community is obviously compelled to return children to their homes for further quarantine before the six weeks isolation has been made effective or else to continue the policy of home treatment with quarantine regulations of a large number of children, who cannot be accommodated in the hospitals.

In the rush for hospitalization, a comparatively small number of children have been admitted as suspected cases or indeed diagnosed cases of infantile paralysis, whose actual condition later is found to be some condition other than that originally suspected or diagnosed. Thus far, there are no authentic reports of such children having become infected through their enforced visitation to the hospital.

Health Commissioner Emerson has frankly stated that this plan is a sanitary experiment. Its evaluation is to be awaited with interest. The least that can be said for the experiment is that it has presented an excellent opportunity to demonstrate the possibility of cooperation between the health department and the various hospitals of the community with a view to supplementing municipal activities in a constructive manner. This represents an important strategic development for the management and control of future epidemics of various types.

The greatest difficulty in controlling

poliomyelitis arises from the fact that the abortive cases are too frequently overlooked and may escape medical attention, and thus keep in a community an unknown and, therefore, more dangerous group of contagium bearers. In addition to these, contagium carriers, who themselves evidence no signs of illness, abound in times of epidemics. It is believed that the number of carriers is in the ratio of five to one case of frank poliomyelitis. The mere fact that an epidemic subsides is, of course, no criterion as to the effectiveness of sanitary control, unless the subsidence occurs during the period when theoretically the incidence of the disease should be maintaining considerable proportions.

Parents, in New York, have unfortunately been in a state of panic. Neighboring communities have arisen in fear and trembling and have sought to limit the travelling of children for fear of permitting the dreaded disease to get a hold in their own communities. Reason and judgment on the part of health officers have been overturned to some extent in the desire to fore-stall an invasion of their own home towns. Their intentions are sincere and in accord with public health ideals. Their efforts at prophylaxis are commendable. Some of their methods are ill-advised. In how far their obsessive fears are justifiable, it is impossible to determine until further knowledge with reference to communicability is available. It is the mysterious nature of the disease and its sequelae which have engendered such emotional responses. Communities have for years permitted epidemics of diphtheria, measles, and scarlet fever to take a large toll from the infant population and to impair the health of their children without creating a sense of panic. Probably the reason for the present hysteria lies in the new

policy of publicity. People have been receiving honest and frank statements as to the prevalence of the disease and the dramatic nature of its onset and the frightfulness of many of the paralyses have appealed to their imaginations which promptly have induced a state of mind where calm judgment is swept away.

It is timely for consideration to be given to the question of the communicability of infantile paralysis. Thus far the infective virus has not been demonstrated in the blood stream so that the theory of transmission by biting insects has not made a compelling appeal to the scientific mind. The fact that the blood thus far has not been proven to contain the infective agent is not positive proof, however, that it does not exist there during some stage of the disease. Flies, fleas, body lice, bed bugs, and various other forms of insect life abound during the season when epidemics are most common, though it is true that epidemics have occurred during the winter months when entomologists would have difficulty in linking up the disease with insect hosts. There are, however, forms of animal life to which attention has not been specifically called which may perchance have some relation to the distribution of the disease.

The question of communicability is undoubtedly obscured in part by the failure of prompt recognition of abortive cases. It may be granted for the time being that direct transmission may arise from an infected patient or from a healthy carrier. Certainly, the degree of contagiousness is not very great. The infrequency of secondary cases resulting either from direct or indirect contact suggests that its communicability is far lower than that of scarlet fever, diphtheria, or typhoid fever. According to Hill of the State Board of Health of Minnesota the

percentage of secondary cases to primary may be reported as follows: scarlet fever 40 per cent, typhoid fever 30 per cent, diphtheria 29 per cent, poliomyelitis 17 per cent. Of persons known to have been exposed to diphtheria, scarlet fever, and poliomyelitis, the percentage of persons contracting the disease was respectively as follows: scarlet fever 22 per cent, diphtheria 17 per cent, poliomyelitis 6 per cent. This light on the comparatively low degree of transmissibility must of course take into account the inaccuracies arising from the fact that all abortive cases are not discovered.

It must constantly be borne in mind that the early studies of yellow fever and malaria indicated the possibilities of direct contagion for many years until the mosquitoes were found to be the real responsible agent in transmission. In Allbutt's System of Medicine (1901) one finds the following statement regarding yellow fever, which has a familiar sound at the present time.

"Of the epidemic characters of yellow fever more is known. When the infection has been introduced into a locality it usually appears in single or isolated groups of cases for the first two or three weeks or longer; and these are restricted to a particular district or districts. In this, as in other respects, it reminds us of the plague. After the disease has once escaped these limits it spreads with a rapidity proportionate to the density of the susceptible population, to the freedom of intercourse between the healthy and the sick, and to the degree of temperature; and its intensity is specially favored by over-crowding, want of ventilation, and, according to some, by an impure, undrained soil, and other insanitary conditions.

When the contagion of yellow fever has been introduced into a non-endemic area the disease is spread by intercourse with the sick, or with contaminated persons, themselves healthy, by means of articles charged with the infection; by residence in or visits to infected houses; and it may be further

propagated by aerial diffusion from house to house, if in close contiguity. The evidence of its communicability by means of water or food, or by the agency of mosquitoes is inconclusive.

It is right to say that these views are by no means universally accepted. As Hirsch points out, 'the most intimate kinds of contact—such as the healthy and sick sleeping in one bed, the attendance of physicians and nurses upon the sick, the use of uncleaned linen, clothes or beds of yellow fever patients, post-mortem examinations of their bodies, and the like—have in no wise contributed to the spread of the disease.'

Osler, writing in 1901, made the following statement which shows how rapidly scientific judgments are altered by increased knowledge. "It is universally acknowledged that in the large majority of cases (malaria) the air is the medium of infection; whether the disease may also be directly conveyed by water has been much disputed; general opinion in the profession favors the view, experimental evidence is directly against it."

In *Surgery of Childhood* (1910) Willard presents a later idea of toxic infection which throws the responsibility mainly upon food supplies.

"The most reasonable explanation of the origin of epidemics (poliomyelitis) is that a specific virus is received through the digestive tract in the milk or food, which toxin penetrates to the central nervous system through the lymph or blood channels."

*Autoinfection*.—The fact that the paralysis occurs so frequently after the digestive disturbances of children or after scarlet fever or other acute exanthemata, would point to some form of autointoxication locating itself in the spinal cord with disastrous results. The increased nervous irritability of the infant during its period of dentition, together with the high temperature of summer and digestive disturbances as evidenced by cholera infantum, entero colitis, and dysentery, are sufficient causes to induce autointoxication.

Sitting on the cold damp ground when overheated, so common in the play of children between two and four years of age, is

often the productive cause of acute congestive cases. Trauma occasionally brings on an attack. The disease may attack healthy and sickly children, rich and poor.

*Contagion*.—In a few instances contagion seems to have been operative in a family or school, but the real causal influence in these cases may have been epidemic or infective."

During the Massachusetts epidemic of 1910, in 200 cases there was certain direct contact with an acute case in 32 cases, indirect contact in 10, and direct contact with a possible abortive case in 4. Out of 186 families, however, only 13 had 2 cases and 1 family had 3. The mere fact of more than one case appearing in the same family is not necessarily indicative of contact infection, particularly, when more than one case breaks out in a single family within 48 hours.

In the Buffalo epidemic of 1912 only 49 (18 per cent) out of 273 investigated paralytic cases gave a history of contact, however slight, direct or indirect with any previous case which might reasonably be considered a case of poliomyelitis. 270 cases occurred in 267 families comprising a total of 1,513 people of whom 762 were children under 16 years of age. Deducting the one primary case from each family there remained exposed to infection by association with these, 1,246 persons. Of the 502 persons under 16 years of age exposed by association to infection by the 260 primary cases the total number of secondary cases were poliomyelitis 3 (0.6 per cent), abortive poliomyelitis 3 (0.6 per cent), suspected poliomyelitis 22 (4.4 per cent). Of the 744 persons over 16 years of age, there was only one suspected poliomyelitis case (0.23 per cent).

From the evidence of these and similar figures, it is patent that poliomyelitis is not highly contagious as the term is ordinarily understood. This is accentuated by the fact

that virus infective for monkeys has been recovered from the nasal mucosa after an interval of six to ten months.

Another item entering into the Buffalo epidemic was the difference in contagion among the cases recorded before and after the opening of schools. Of 202 cases occurring before the opening of school 13.9 per cent were in children entered in school. Of the 84 cases occurring after the opening of school 29.7 per cent were in children attending school. The 84 cases with an onset subsequent to school opening occurred in 83 families. At first glance these figures would suggest that the schools played an appreciable part in spreading the infection. A survey of the incidence of the disease in various sections shows that there was no grouping of cases in any particular schools to any greater extent after September 3rd when schools opened, than was found among the cases developing before that time in relation to the schools at which the afflicted children were registered. Commissioner Fronczak's conclusion is "that if the schools did play a considerable part in disseminating the infection after their opening, it was not so much from recognized as from unrecognized sources of infection among their patrons."

It would appear at the present time that whatever may be the rate of infection, the principal contagium possibly arises from sources other than the recognized cases. Whether or not this conclusion is warranted the present studies of the New York epidemic should certainly demonstrate. If, however, this should be proven to be the case, we shall be in a position to judge the advantages and disadvantages of the modernized efforts to control the epidemic. Until data of this character are available, it is impossible to pass judgment upon the

effectiveness of the methods by the Department of Health.

In the presence of a large mysterious epidemic with high mortality and the likelihood of a number of potential citizens reduced in physical effectiveness, it is only proper that a health department should take advantage of every known means of attacking the problem. Practically for the first time there has been organized a large working force, including the entire corps of the Health Department, the scientists of the state and the nation, together with the hospital and laboratory facilities of a metropolitan area, engaged in an active study of the nature of the epidemic during its progress.

Thus far, therapeutics is silent as to cure. There is sufficient knowledge of management of individual cases to warrant prompt attention to the sufferers with a view to minimizing the damage inflicted as a result of the infection. The prevention of deformities is of maximum importance. As a specific infection, general in nature, with local manifestations in various parts of the body, with the greatest force apparently spent upon the nervous system, it has thus far baffled all efforts at cure. Meltzer's suggested use of adrenalin by intraspinal injection merits trial.

The various classifications which have been made are of scientific interest but thus far refer principally to those types in which the manifestations are to be found in the cerebrospinal system. Those types of the disease which are collectively termed abortive and which present mild and easily overlooked symptoms in the gastrointestinal and respiratory tract are probably of more importance from the standpoint of prophylaxis than those with frank paralysis, more or less extensive.

The fact that over 90 per cent of the cases occur in children under the age of 5 years and indeed largely during the first 3 years of life, throws this disease into the category of diseases of childhood. The median age of death from this cause in 1913 was 3.9 years. It is hoped that the present epidemiological, clinical, and laboratory studies will not end merely in more detailed classifications of the disease but will reveal further important facts to aid diagnosis. The monumental result whose achievement is sought is the method of transmission and further corroboration, which involves the complete satisfaction of Koch's laws, as to the nature of the infecting agent and the means of identifying the contagium bearer. From a public health standpoint, the prophylaxis of infantile paralysis is the most serious problem of the present time.

The endemicity of the disease is recognized. During 1915 there were 1660 cases recorded in 24 states of the Union, with admittedly incomplete reports, particularly lacking in accurate figures for the abortive cases. In the registration area there were recorded in 1910, 1,459; in 1911, 1,060; in 1912, 1,136; and in 1913, 864 deaths. The annual average for 1901-1905 was 1,589 deaths and the average for 1906-1910, 2,736 deaths. The average annual rate per hundred thousand population for 1910 was 2.7; for 1911, 1.8; for 1912, 1.9; and for 1913, 1.4. This death rate per hundred thousand population for the registration area was greater than that of smallpox, rabies, Pott's disease, disseminated tuberculosis, scurvy, but was tremendously exceeded by such diseases as typhoid fever, malaria, measles, scarlet fever, whooping cough, diphtheria, influenza, tuberculosis, syphilis, meningitis, convulsions of infants, the pneumonias, diarrhea and enteritis, and

similar diseases which are prone to occur during infancy and childhood.

Assuming an epidemic in New York City with 2,500 cases of poliomyelitis in an estimated population of 5,600,000, there would be a rate of 44.6 per hundred thousand population. With a high mortality rate of 20 per cent, the death rate would be 8.9 per hundred thousand population. Bearing this fact in mind, it must not be forgotten that New York City's death rate for 1913 from measles was 13.9, from scarlet fever 11.0, from whooping cough 7.7, from diphtheria 26.1, from tuberculous meningitis 15.7, from diarrhea and enteritis under two years 73.5, from congenital debility and malformations 84.2. If the present epidemic should consist of 5,000 cases, the rate of incidence would be 89.2 per hundred thousand population and with a fatality rate of 20 per cent, the death rate would be 17.8 per hundred thousand population.

These figures are presented in this way in order to show the needlessness of the present hysteria. Without a knowledge of the facts of municipal infection, the citizens of New York City have been constantly exposed to more serious death dealing diseases without evoking such a mob response. The campaign against infant mortality has been continuously waged with sane judgment, scientific forms of attack, and great results have been accomplished. Even when mothers feared the second summers for their children, there was not such a mad exodus of hysterical parents as is to be noted today. Fear is the dominant passion and merely because relative values are not clearly established in the minds of the more intelligent and rational part of the population.

People, today, are fleeing to small communities where the presence of a single case of poliomyelitis represents as great or a

greater source of danger than exists in the City of New York. To illustrate, one case of poliomyelitis in a city of 25,000 inhabitants is at the rate of 4 cases per theoretic population of one hundred thousand. It requires 226 cases of poliomyelitis to appear in the City of New York to create the incidence of 4 per hundred thousand population. A single case of infantile paralysis in a community of 10,000 is a theoretic rate of 10 per hundred thousand which is equivalent to 560 cases appearing in the City of New York. The large dilution of infantile paralysis cases in New York City due to the overwhelming population makes New York even with the present epidemic, a reasonably safe place on the doctrine of probability of infection.

The susceptibility to an infection with the virus of poliomyelitis apparently is not great. Only a comparatively small proportion of the population is attacked though the virus may be widely distributed among the healthy population. Natural immunity may be responsible for this fact but here again one enters the realm of conjecture.

The horror engendered by a fear of consequent deformities may be mitigated by realizing a few items. According to Wicksman at least 25 per cent are abortive cases without paralyses. Complete recovery or at least functional recovery occurs in certainly 25 per cent of the paralyzed cases. This will be increased as more rapid diagnosis and deformity-preventing treatment is instituted. The period of recovery of function may require 1 to 4 years patient care. Assuming a mortality rate of 20 per cent. there will thus remain about 40 per cent with permanent deformities and impairments of function in varying degrees. In contemplating these unhappy residua let the calm prognostician recall the damaging handicaps of

heart, lungs, eyes, ears, joints and kidneys that are bound up in the human story of tuberculosis, measles, scarlet fever, whooping cough, rheumatism, syphilis, and other diseases of infancy and childhood. There is ample opportunity then for optimism regardless of the oppressive fear of permanent disability for useful service.

The Health Department should receive every support possible from the medical men of this community and in all sections of this state and other states in allaying the hypertrophied fears of the populace and arouse them to an understanding of the facts connected with poliomyelitis. The medical profession itself should endeavor to combat the hysteria of the community and bring back as far as may be possible a rational point of view to the populace in the face of the present epidemic, whose seriousness is not minimized, but whose contagiousness can only be estimated in relative terms. Physicians themselves are feared by many parents as spreaders of contagion and many practitioners engaged in fighting the epidemic are already sacrificing their practice, as Commissioner Emerson has publicly announced, because of the exaggerated and undiscerning fears of parents, while the physicians are engaged in a splendid public service.

The wisdom of the profession, in the light of its common knowledge and general information upon the subject should be marshalled to the support of the Health Department and the authorized officers of the State of New York with a view to controlling the present epidemic, limiting the disabilities, investigating possible sources of contagium, in raising the sanitary standards of the community and in devising sound schemes for municipal prophylaxis against this scourge which at present has devastated many bodies but has undermined many

more mentalities. Poliophobia is to be discouraged and physicians should be the first persons to rally to this form of public service.

230 West 97th Street.

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## SPECIAL RADIUM NEEDLES IN USE AT THE RADIUM SANITARIUM OF NEW YORK.

BY

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While in England last summer, the writer observed some very interesting results in the treatment of new growths in various parts of the body by the insertion of radium emanation in the body of the tumor. This emanation is inserted by means of very small glass capsules pointed at one or both ends, filled with the emanation. These tiny glass bulbs (or seeds) are placed in the tumor by means of hollow needles whose calibre is large enough to carry the seed. The needle, usually four to six inches long, is driven into the tissue of the tumor until it reaches approximately the center, then the glass containing the emanation is pushed down through the hollow air stem. A small obturator is used for pushing the bulb home. The needle and the obturator are withdrawn, leaving this glass bulb behind in the tissue. The patient either remained at the sanitarium during the treatment or returned to his home at a distance. As radiation takes place in every direction from the element as a center, this method of treatment seems a most attractive one, and is theoretically perfect as to the location of the application.

In the service of Mr. Pinch of the London Radium Institute, this treatment under the direction of Sir Edward Treeves ap-

pears to have been quite successful. The same method is being carried out at the Huntington Cancer Research Laboratories in Boston by Dr. Duane and also at the General Memorial Hospital in New York City.

An objection to this treatment, a purely economical one of course, is that in order to obtain the emanation and use it frequently, a considerable amount of radium must be kept continually in solution. Only 17 per cent. of the emanation of radium in solution is obtained in the first twenty-four hours. In the next twenty-four hours 14 per cent. It takes four days to obtain 50 per cent. For the emanation to equal the amount of radium in solution

Seven gold needles containing collectively 50 mgrs. of radium element.

or to reach equilibrium requires twenty-eight days. A good deal of time is thus required to procure the emanation. In a very active service, this is a great drawback. Another possible objection is that the little seeds left deeply seated in the tumor may become a possible source of irritation and infection. Unlike the radium itself, the emanation has not a long life, its effect decreasing very rapidly. It reduces

itself 50 per cent. in 3.85 days, and in twenty-eight days its usefulness has entirely gone.

It occurred to the writer, that a series of hollow needles filled with varying amounts of radium would have the same effect as the insertion of the little glass seeds, and that this effect would be more thorough and exact, and permanent as long

Last summer under my direction seven such needles were made, five containing approximately eight mgr. of radium and two, five mgr. each. The needle consists of a sharp pointed steel gold plated hollow tube with a ring at the end opposite to the point. The ring and the blunt end of the needle are firmly and smoothly soldered to the hollow part after it has been filled with radium. The steel wall is 0.3 mm. thick and the gold about 0.01 mm. Iridium points are preferable, and in my next needles I expect to make use of them, but this time the iridium was not easily obtained without some loss of time, and I was in a hurry to make use of the needles for a special case which was then waiting. They are especially adaptable to tumors of the thyroid, various isolated enlarged glands, as well as for the various tumors of the breast. So far I have used them for two carcinomatous glands of the neck, two cases of isolated glands, and one case of sarcoma of the humerus involving the whole circumference of the bone, as well as in tuberculous glands in the axilla.

The needles can, of course be inserted in the tissue of the circumference of a large tumor at equal intervals, radiation thus taking place in all directions from each needle as a center. This is theoretically at least, a very desirable way of getting the effect of the radium.

The accompanying photograph shows the needles life size. Here is also a photograph of a special needle which is made to contain 50 mgr. of radium to be used in a carcinoma of the larynx. This was made at the suggestion of Dr. Coakley. It is of a special alloy of which gold is a large constituent. Its wall is 0.25 mm. thick.

46 West 55th Street.

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Needle carrying 51 mgas. of radium element.  
as the needle remained in position. The amount of the element thus applied can be more accurately measured by using the radium itself than by the use of the unstable emanation. The needles may be used as well for radium applications in other cases, exactly as if the radium was in the ordinary brass, silver, glass, hard rubber, or other containers.

## THE MEDICAL CARE OF CHILDREN.<sup>1</sup>

BY

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It has been a long tedious road, often punctuated by inconsistency, inhumanity and crude humor, by which we have come to our present ideal of free and compulsory education for all children.

That the safety and success of our democratic institutions depend upon an intelligent citizenship few will question and it only remains for us to more efficiently methodize our systems of education to reap the greatest benefit from them.

It is unnecessary to spend time and energy to demonstrate that one of the most important factors which militates against the success of any educational system is the physical inability of the children to take full advantage of the facilities for education which are placed before them.

Industrial economics maintains that in so far as any given equipment, for any reason, falls short of its normal quantitative and qualitative output, there is economic loss and waste.

So long as we fail to realize that this principle maintains also in our educational work, so long will there be unnecessary loss and waste of energy and so long will we fall short of economic and social efficiency.

Every year millions of dollars are lost in our educational efforts through both the quantity and the quality of our output.

Our educational budget in Rochester is about a million and a half dollars. Of this amount it may fairly be said that we lost last year, one hundred and seventy thousand dollars because of the reduction in our

quantitative output. It cost that amount to reeducate the children who for one reason or another failed to make their grades. The magnitude of this loss may be estimated when we know that Rochester's record in this regard alone was the best with two exceptions in the United States. During Sept., Oct., Nov., and Dec. of 1915 our children lost because of sickness 51,089 days of time. What this means may be better appreciated if expressed in a different way. It is just the same as if a school of five hundred and ten children and fifteen teachers with all the equipment was put out of business absolutely for these four months. It means if it could be expressed in money that about fifty thousand dollars are lost each year just from illness among the children. But it cannot be expressed in money and the dire effects only show themselves in the ultimate quality of our output.

And the qualitative analysis of our output is a more complex problem; suffice it to say that while many of our children do succeed in keeping up with their classes, the quality of their work is such as inevitably results in more or less economic and social inefficiency.

To be sure our school systems are not infallible; this lowering of the value of our output may be partially due to faulty pedagogical methods, but I believe that a perfectly healthy child may become an efficient social unit in spite of minor pedagogical errors, while for a child more or less afflicted by acute or chronic physical handicaps this is practically an impossibility.

The causes of this social and economic loss are I believe largely medical, using the term in its broadest sense, and if the problems of community efficiency are ever to be solved the medical profession must put its mind to the test of devising some plan of

<sup>1</sup> Read before the Monroe Co. Medical Society, May 9, 1916.

medical effort which will prevent and counteract the ill effects of these physical handicaps in our children.

Whatever plan we may adopt in detail, certain ultimate ideals should direct our progress. We may not reach them at a bound but we could reach them more quickly than we think if we would handle the problem as a profession and ignore the temporary ill effects which the plan might have upon the individual.

First it is important that we demonstrate the truth of our premise that children are handicapped by physical disability and that when this handicap is considered in the aggregate it results in very grave economic and social loss to the community.

This has been proved beyond doubt by many special investigations and by the work of the now well established systems of medical school inspection.

A few years ago compulsory medical school inspection, as an ideal, became a policy in our public health service, not only for the large cities but for every school in the state. To be sure it is still an unrealized ideal for much of the work done under the law is pure unadulterated punk.

Parents are advised, by the medical examiner, of defects or disability which in his estimation handicap the child in its school work and they are advised to attend to the matter at once, and in some cases the child may be excluded from school until the trouble is remedied.

Compulsory medical school inspection is irresistibly bringing us to the point where more or less pressure will be put upon parents in our insistence that physical defects and disability be immediately remedied if possible.

In so far as we recognize the importance of medical inspection and the desirability

of some degree of insistence that remediable defects be attended to, we practically assume the obligation to provide the means by which children may receive proper care and treatment.

Private philanthropy has in some measure endeavored to provide this means but they have confined their efforts to so-called charity cases and unfortunately they have had little of the constructive element in them. They have done charity for charity's sake and with little idea of increasing the community's sense of its obligation for the health of its children.

It is an illogical and unrighteous principle which makes our children objects of charity. They are our best asset and whether they are the children of well-to-do or of poor parents the community owes them the opportunity of living healthful lives if it is possible.

This is not an unheard of proposition. A number of cities are well on the road to complete socialization of the medical care of children. New York has for several years maintained several nose and throat clinics and now has seven dental clinics; Los Angeles employs three dentists and also does eye, ear, nose and throat work; Cleveland has five dental clinics; and Chicago has fourteen dentists in her public schools.

All of these cities give this medical care to only the so-called poor children, the financial standard for the service varying, but most of them give at least emergency care and treatment to all children.

It remains for Toronto, Canada, to show the way to the full realization of the logical ideal of medical work for children. She has fifteen dentists in her public schools, paid by the city, under the control of the city, and they give dental care to every child in Toronto who needs it irrespective of the

financial standing of the parents. Last year they gave full dental treatment to 6,000 children and in four years they have reduced the dental necessity in the public schools from 95% to 65%.

All of these cities have moreover adopted the logical method of organizing the work in that they have divided it into more or less widely separated units depending upon the centers of greatest need and the centers of density of child population. The clinics are maintained in the school buildings. One clinic in New York is not in a school building and one in Philadelphia is in City Hall.

Toronto has given us the first example of the full realization of the ideal in medical work for children.

This ideal is four fold.

First—Under municipal control.

Second—Financed by the city at large.

Third—Service given to *all* children.

Fourth—Clinical units established where the work can be done most efficiently and with the least wasteful expenditure of the time and energy of the children, the school authorities and the parents; namely in the school buildings.

You may not know it but this is the Rochester ideal and all of these cities received their first inspiration from Rochester.

Then what is the matter with Rochester?

Why is it that Rochester, so virile in pioneering constructive ideals, seems unable to carry them on to full and complete realization?

Except in New York and to a slight degree in Los Angeles the only branch of medical work attempted has been dental work and in almost every case the pioneer work has been done by the local dental associations, and when the work was well established it has in every case been turned over to the city.

All other branches of medical work are practically untouched.

Medical practice today, as probably in no other period of its history, is in very active transition. From emphasis upon curative methods we are rapidly swinging to prevention. Especially is this true in our work with children.

Compulsory medical school inspection is one of the most important steps in this transition.

During this transition there is bound to be more or less economic turmoil in our profession and maybe some men will be crushed between the upper and nether mill stones.

However I believe the distress has been unnecessarily exaggerated by our own opposition to the transition. It has caused it to be too long drawn out and we have made no concerted effort to rearrange our medical ideals to meet it, nor have we attempted to direct its course.

The dental societies the country over have blazed a path which organized physicians would do well to follow. They organized their efforts to conform to the four fold ideal of which I have spoken and with one exception, Rochester, they are well upon the way or have fully realized their ideal.

Outside of medical school inspection most of the work for children has been carried on by so-called philanthropic institutions. The actual work is done by the physicians without pay and often with little credit. The direction of the work is and has been in the hands of these institutions, which unfortunately for too long a time have nurtured the ideal of establishing large and permanent philanthropies, and never for a moment, except in academic discussions of the theories of charity behind the closed doors of their board meetings, have they con-

sidered the constructive policy of putting the community in a position where their form of charity at least would be unnecessary.

Medical work for children in the first place is not a charity problem and never has been although it has erroneously been treated as such.

Every dollar and every ounce of energy expended in keeping them in sound physical and mental health will in later years yield enormous dividends in community efficiency.

Now, just so long as this work is directed by charity organizations, with the usual charity organization ideals, just so long will the inevitable socializing of it be delayed; just so long will people try to buy their entrance into heaven by so-called charity work, while the physicians do the real work without pay; all the time delaying the day when we shall take our logical place in the community as conservators of the public health, instead of exploiters of the public health.

It is because of this state of affairs that much of the work done in the past has been of very poor quality, at least it has been far below what I believe the average physician is capable of. Moreover it is a great temptation to do sloppy work and to soak people when the opportunity comes to do something for pay. This is a situation which we should face fairly and squarely.

Now, if this work is worth doing at all it is worth doing well, whether we undertake to do it for nothing or for pay; and if it is a community problem there is no reason why it should be carried on under the guise of charity and there is no reason why the economic value of the work we do should not be recognized by the community.

Under the direction of charity, physicians have volunteered to do this work for children for two reasons; first, because they

really and honestly wanted to do something for the children; and secondly, because of the opportunities which the work offers for clinical study and experience.

In Rochester this work has been carried on by four philanthropies and I need not argue that the work has not been done as well as it should be done, nor that there is no cooperation between the various charities and especially that there is no cooperation between them and the health and school authorities looking to a real constructive effort to improve the health of our children.

I believe the time has come for us to consider how best to bring about the rapid transition of medical work for children from an unconstructive erroneous charity problem to a constructive community problem.

For many years there has been unfortunately a spirit of antagonism between laymen and the profession. This I believe has been one of the important reasons why patent medicines and other forms of quack practice have gained such a foothold in our midst.

If the physicians would undertake to socialize the medical care of children and honestly and efficiently organize their efforts, I believe it would go a long way toward re-establishing a healthful spirit of cooperative interdependence between physicians and the people which should be the rational basis of all our relations.

Medical school inspection in Rochester is under the direction of the Health Officer and never has it been so well systematized nor have the men done such good work as at the present time. In eight of the larger schools we have school nurses well trained in the care of children and in the follow up work in the home so necessary in efforts of this character. The school physicians and

nurses are in daily touch with something like fifty thousand children, hundreds of whom are in urgent need of medical care, training and advise.

But however efficient this part of the work may be it can never accomplish what we desire for it unless it is augmented by this next logical step.

If the men of Rochester really wish to do something worth while for the children of their city; if they really want unusual clinical opportunities; if they would like to do something which would make Rochester the lodestone of medical school work in the country; then I suggest that they get together and in cooperation with the health and school authorities establish a number of medical clinics in our schools, organizing them of course with the ideal of completely socializing them at the earliest practicable moment.

A work of this kind organized in sympathetic cooperation with the health and school authorities would undoubtedly result in a great reduction in our infant mortality and in a greatly increased health and mental standard for the children of the city, and at the same time it would gradually but surely put our children's hospitals out of business.

What greater work could the men of this city undertake than this?

In rural communities the idea could be worked with equally good results.

Of course the question always comes up, what will the economic effect be upon the profession?

In England the profession opposed the practical working out of the health insurance bill because of supposed economic reasons but the real effect has been to put the profession upon a firmer financial basis than ever before. Many dentists opposed

the school dental clinics for the same reason. I have yet to hear of a dentist whose business has been injured by school clinics and whose community spirit has not been considerably strengthened.

I believe that a well organized effort of this kind, giving medical care and treatment to all children who need it, teaching and practicing the principles of prevention intensively, would not only bring about a finer community bond of interest between the people and the physicians but it would result in more legitimate and stable economic conditions than the profession has ever experienced.

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## THE ART OF OBSTETRICS.

BY

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As every book must begin with a "Preface," a moderate respect for the opinion of medical readers probably requires that all papers pertaining to our art of healing should begin with something like an "Introduction."

In recent years we have heard much, and none too much, concerning "Preventive Medicine," and names that a few years ago were unknown outside limited circles, rank today with the most illustrious on the scroll of medical immortals. Walter Reed is mentioned with Sims as a benefactor of humanity, and it is no longer regarded as heretical to place Koch above Frederick the Great in Germany and Pasteur before Napoleon in France. Lister long ago outdistanced Wellington in England as elsewhere. "Looking at the world as a grand whole," as some of our young orators are wont to exclaim, it may even be hoped that

some time before the head bookkeeper at the pearly gate draws a red line under his balance sheet, the human family may come to honor those who save it from suffering and premature death quite as much as it has heretofore glorified those who have put it to fire and the sword!

In the general march of preventive medicine, meaning thereby all branches of medical science, thoughtful observers can not have failed to note one overshadowing exception. Howard Kelly, J. Riddle Goffe, Clarence Webster and Palmer Findlay, all ranking at least as Field Marshals amongst men of science, every one worthy of all his laurels, must bear with me when I say that their successors in the next generation or two will seek honors in another and more glorious field. I refer to Preventive Gynecology.

There is one department of medical science that ante-dates the pyramids and even received authoritative recognition from so distinguished a man of letters as Moses himself in his matchless narrative of events in the Garden of Eden.

I mean, of course, that oldest and most neglected of all arts, the art of obstetrics, without which no other art would ever have come into being. There can be no possible doubt that Abraham recognized something of its importance and I have always felt a sense of astonishment that Solomon did not give the subject sufficient investigation to see the vital necessity of founding a school where the art might have been taught in all its purity.

Speaking seriously, and never more so, until the art of midwifery as it is generally practiced is revolutionized, women by the hundreds of thousands will suffer days without end, and continue to suffer in defiance of the highest gynecological skill

available on the face of the earth. What is needed is not another Diet of Worms, not another "Reformation" such as came from Geneva or Epworth, but another regenerating movement, another French Revolution with a modern Robespierre at the head of it. Dusting the fancy rugs and mopping the floors will serve no good purpose. There must be a houseburning, followed by rebuilding, a concrete foundation going down to bed rock upon which may be erected a structure along scientific lines that will endure for the ages.

Some illustrations may not be out of place. Several weeks ago at a meeting of the County Medical Society, I brought up this subject and made an earnest plea for the recognition of obstetrics as one of the *respectable* arts. After adjournment several members said to me, in effect:

"Of course, you are right, but what can you do in the face of a stone wall of prejudice? We charge \$25.00 for the average case, and it is the rule to throw in four after-visits."

"Do you do any reparative work at the time, in case of necessity?" I inquired.

"Why, no," replied one. "People generally are not willing to pay for 'extras,' and I never like to force my services where I know, and you know, they will not be appreciated."

Since I began to prepare this paper a veteran practitioner, a man of ripe general experience, narrated to me the details of a complicated primary labor, followed by a dangerous hemorrhage and timidly inquired whether I would regard "thirty dollars as an overcharge!" As my reply would in no case pass the editorial blue pencil, I shall not repeat it in this place. No wonder that our local veterinary brethren drop a compassionate smile at us as they whiz

past in their handsome touring cars! In the plenitude of our poverty, however, it is consoling to remember that many cows and mares receive highly skillful attention during the parturient period.

Obstetrics is not amongst the respectable arts, and never will rank as a respectable art until it is made respectable. Some thirty-odd years ago I ventured to suggest to a fellow student that I felt some degree of uneasiness concerning the entire safety of surgical anesthesia. My companion in ignorance turned, gave me a compassionate smile, and let fall the following gem of practical medical wisdom:

"Why, sonny, anybody can give ether."

Certainly anybody can. Likewise any clumsy fool, more particularly an old fool, can "take care of a laboring woman." Nothing difficult about the "average" case; in fact, the woman herself generally does most of the work, and the doctor frequently makes an overcharge when he makes any charge at all—if his skill and equipment are taken into account.

Every case of obstetrics comes under one of two heads: physiological or surgical. There is no middle ground. Either a labor is normal or it is not. The instant it ceases to be normal, it comes within the domain of surgery. There is really no such art as obstetrics, respectable or other. The attending surgeon should approach a complicated labor precisely as he deals with any other surgical complication. To fore-stall shock, to prevent or control bleeding, to unite separated tissues by proper methods are the very essence of surgical practice.

Reports of overcharges in surgery are common enough, many are pure exaggerations upon the part of swindlers who never pay for any service where it is possible to avoid it, and some it must be confessed are

grounded upon sheer extortion, as where a third rate bungler makes a charge that would be the due of a skilled surgeon. Surgery as applied to the complications of laboring women, however, is almost universally underpaid. An uncomplicated appendectomy, requiring a few moments of time and causing no interruption in the general work of the practitioner, is looked upon as something worth a respectable charge and is often regarded as a feat of the first magnitude by the ignorant; a prolonged labor, accompanied by unavoidable complications, resulting possibly in the loss of the child, robbing the attendant of his sleep and keeping him waiting for hours in succession, offers the financial return that would be spurned by many a skilled artisan whose responsibility is "as a molehill to a mountain" when compared with tremendous risks that must be assumed without hesitation by the surgeon.

Several years ago I spent a day in a county seat town of seven thousand inhabitants. My host was a practitioner of forty years' experience. His state is one of the richest and most populous in the Middle West. We had just concluded a tedious and vexatious operation for the correction of fecal incontinence due to a complicated labor in a woman of 23 years. I ventured to ask the old practitioner something about the practice of obstetrics in the locality. I was told that there existed a "general agreement" amongst "all the doctors," including all the "pathies" and most of the "isms," to accept all cases "within riding distance" for a uniform fee of ten dollars.

"Do you consider your term of service ended when you have handed over the child to the nurse?" I asked.

"Oh, Lord, no! Cases in town and around the edge we look after every day for a week; where they live clear out in

the country, we generally go out two or three times."

"How about complications? Do you ever have them?"

"Why, not generally. Our people don't take any stock in chloroform, as a rule, and we let 'em peg along without it. I sometimes give it myself, as people kick on paying three dollars extra for an outside man to come in to use it."

"What do you do for a certain number of unavoidable lacerations of the maternal parts?"

After three or more rounds of robust laughter, the old doctor shook his head at me reprovingly and replied:

"That's where I've got it on you cuttin' fellows. By jingo! I just tell 'em. 'See here,' says I, 'if I can only keep them surgery fellows away from you, why, you'll be able to put the clothes on the line Monday mornin' by early sunup.' No, just leave those things to Nature and you will never fail."

"Doctor aside from my consulting work I have no obstetric practice, and I shall be glad if you will give me a few hints as to the practical management of childbed fever."

To employ a vulgarism, this "brought down the persimmons." The eyes of the veteran glowed with uncontrolled pride when he assured me that I had come to the fountain head for practical wisdom concerning puerperal fever. He had "enjoyed" more experience in this line than any dozen other doctors in the entire county. He had long ago demonstrated that the germ theory had no possible bearing upon the disease. It was, in the main, a condition arising from impure blood, although he had met with it in young women whose health and general appearance would have led none to suspect that puerperal fever might at-

tack them. Carbolic acid, he felt assured, had been responsible for some of his deaths. On the whole, he was inclined to regard the disease as Providential in origin and altogether beyond the range of human control. Finally, childbed fever reminded him strongly of Asiatic cholera, of which he had seen several cases.

The medical profession is to blame for the scandalous abuses in obstetric practice. It may be set down as certain that the general public will take no steps to correct something that it knows little or nothing about. There being thousands of robust men and women in the world today who were attended by the "old famuy doctor" with dirty hands and unclean garments, is of itself sufficient proof that things are well enough off as they are. Meddlesome midwifery is on a par with murder and treason. And, of course, to admit that surgery has a place in the sacred temple of obstetrics would mean the speedy and certain extinction of the human species, so deadly are the ways of modern surgery. When matters arrive at the pass where every baby that comes into the world must be attended by a surgeon, it will not be far to the station where people will be compelled to boil suspected water before drinking and made to sterilize their wearing apparel after it has been infected with the elements of deadly diseases.

A pregnant woman should be told with perfect frankness that her condition at the time of her coming labor will be surgical; that the knife may be as little indicated as a plaster cast or a row of stiches; that dangerous complications are the exception, but when present must be met with unfaltering determination and appropriate measures of relief—all this, it is urged, should be made doubly plain to any expectant mother, who, in case of accident,

will have been prepared in her mind for those indispensable procedures designed wholly for her own security and ultimate welfare. Thousands of silly persons shy at the word surgery precisely as a frightened horse darts away in a frenzy at the sight of a flying scrap of paper; they are just the people who nurse an infected appendix laden with a deadly charge of infection and who go about with unsightly growths dangling before the public eye. Fortunate the woman in normal labor, and doubly unfortunate is the one who in the face of surgical complications falls into the merciless hands of the unskilled.

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## ECHOES OF ACIDOSIS.

BY

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After reading the splendid Acidosis Number of AMERICAN MEDICINE, it occurred to the writer that it might be just as well to rummage among the books of the last century. The result is this little "composite photograph" which may or may not contain valuable points, but it is abridged from Prout, Bence-Jones, Wilson Fox, Edward Curtis, Lauder Brunton, Maly, Von Harringen, Bartholow, Ringer and some others. None of it is original but I trust some of it may be useful.

The urine is a curious fluid and too much dependence must not be placed upon it as a means of estimating excess or deficiency of acid in the system, because it sometimes happens that in highly acid conditions the urine is alkaline. This may occur when large quantities of acid fluid are poured out of the stomach. In the eczema of gouty persons so long as that disease persists, the

urine is either of low acidity or alkaline; but the subsidence of the eczema is frequently followed by an over-acid condition of the urine, accompanied by renal or vesical catarrh or both. The chemical paradox, of an alkaline blood giving forth an acid urine, has a simple explanation which is, that a mixture of neutral sodium phosphate and acid sodium phosphate may be placed in a dialyzer and the acid diffuses more rapidly than the bases, consequently the water outside the membrane will quickly become acid while that on the inside will prove to be neutral or alkaline. The urine passed before breakfast is usually acid, but two or three hours after a substantial dinner it becomes neutral, or alkaline, or turbid from the precipitation of phosphates. Substances introduced into the blood from newly digested food form a conglomerate, but usually alkaline solution.

There is also presented this series of paradoxes: urine mixed with di-sodium phosphate is alkaline, the addition of uric acid unites with a portion of the base and all becomes acid. Furthermore the passage of excessively acid urine may produce inflammatory discharges from the walls of its passages, and the latter may render it alkaline during its passage.

Acidity of the body depends upon two causes. (a) Deficiency of elimination. (b) Excessive formation. The great cause of (b) is insufficient oxidation consequently there should be a careful study of the blood, for if aglobulism (deficiency in number plus deficiency in hemoglobin) be present, and the red corpuscles be too few and too feeble to furnish sufficient oxygenating surface and substance, it will at once give rise to various symptoms of the most vital import, for every vital process is absolutely dependent upon a free and immediate supply of oxygen. The respiratory and circulatory

movements are accelerated, the complex processes of alimentation and secretion are performed imperfectly and the results are dyspepsia, constipation and disordered sanguification with all their vicious circles which intensify an abnormal blood-glandular-urinary state with its diminution of muscular contraction and lessening of physical force. Bodily growth and development (sexual organs, etc.) remain incomplete or puberty is deferred. For he who passes the products of exhaustion through gland or muscle suffers exhaustion. The organs and the connective tissues may become loaded with fat instead of suffering atrophy, as they do when blood plasma is deficient, the coloring matters of the bile and urine may be deranged and nutrition everywhere suffers, its materials being insufficiently oxidized; and the blood, the urine, the skin, the circulation, the respiration, and the nutrition of hair and teeth may produce evidences of a disturbance so profound that it has for its secondary effects imperfect changes in the food ingested, diminished peristalsis, deficient or altered secretion from mucous membranes, and changes in the output of the pancreas and liver.

Suppose the blood to be almost normal in appearance under the microscope, and suppose it quite capable of carrying and distributing oxygen, manifestly it would be of little avail for such advantages if oxygen were withheld from it by pulmonary insufficiency or by lung laziness. In persons following a sedentary life acids may be oxidized and the economy set right by exercising more diligence in breathing. Ineffectual breathing if long persisted in may produce such vague and unreliable symptoms that patients may become small chested and fat-hipped without being conscious of any injurious results from marked derangements of the function of respiration, the

want of due aeration of the blood and interference with the general venous circulation.

Admitting that the lungs and the thoracic movements are normal, there are physical conditions which interfere with the respiratory apparatus yet they are quite independent of it. Flatulence, tympanites, fluid in the peritoneum, enlarged organs (ovarian tumors, pregnant uterus, etc.) and food especially if complicated by dyspepsia. There are also conditions which are connected with the main air passages and these are usually overlooked or disregarded and by no means receive the thought and attention which their importance emphatically requires if we are to solve problems based on the cause of cyanosis, chilliness or coldness, mental apathy, dull headache, morbid blood supply to brain, languor, laziness and muscular weakness, dyspeptic disorders, changes in urine and other phenomena including the onset of sudden, rapid apnea or respiratory arrest.

Such obstructions may be situated in the mouth, throat, larynx, trachea or even the primary bronchial divisions. Coughing and sneezing rarely occur simultaneously, atrophic rhinitis is often a forerunner of pulmonic phthisis yet that the nose is an organ of respiration is evidently yet to be discovered. But a blocked nose renders normal respiration and blood oxidation quite out of the question.

In using alkalies for their effect upon the urine the citrates and acetates are better for prolonged administration and these are to be used in connection with the readily obtained bicarbonates.

B. Sodii bicarb. 5iv.

Div. in chart No. xii.

Sig. One powder in half tumblerful of water every four hours until the urine is alkaline. LOOMIS.

R. Acid salicyl. ʒiii.

Sodii borat. gr. xv.

Aq. Menth. pip. ad ʒiv.

Sig. One-third to be taken every twenty-four hours. Then when finished

R. Ammon. bromid ʒiv.

Div. in chart No. xii.

Sig. One in water every four to six hours.

DA COSTA.

When quinine is added to drawn-blood it prevents acid fermentation. An enterocolitis which resists every possible combination will yield readily to quinine, and the latter is largely employed before and subsequent to surgical operations. Small doses have proven to be valuable adjuvants to any treatment of the genito-urinary tract whether it is of medical or surgical nature.

If the urine is alkaline then sodium benzoate will render it acid. Saccharin has similar powers hence should be given with caution to diabetics with acid urine. Benzoate of soda is as near harmless as a salt can be and may be given in doses up to three hundred grains a day.

Oxidation occurs easiest in alkaline media, so when the stomach is pouring out its acid secretion the salivary, biliary and pancreatic juices become unusually alkaline and thus a balance or conservation is maintained, but the combustion of the lungs and the exit of the kidney, these are the chief controllers of alkaline or acid excess. The link that binds the two is that circulating oxidizing fluid which acquires its oxidizing powers from its absorption in that lung and eliminates its ashes by filtration through that kidney. Perspiration and defecation are valuable but subordinate auxiliaries.



**Swimming Pool Sanitation.**—While a seemingly large part of the population is enjoying the facilities of bathing in stream, lake, or ocean, another larger part of the community is dependent for bathing facilities upon swimming pools conducted by commercial organizations, public schools, athletic clubs, or philanthropic agencies. The importance of swimming as a protective device, as a recreation, and indeed as a cleansing factor is increasingly recognized.

It has long been known that pools constitute a recognizable factor in the transmission of infectious diseases. Intestinal diseases, disease of the eye and ear, respiratory diseases and even venereal diseases have been described by Manheimer, Lewis, Whipple and other investigators studying the infections of bathers in the pools of educational institutions of various types.

It is not possible at the present time to adequately safeguard bathers in natural streams, save in so far as their intelligence enables them to accept and follow the information and advice given by health authorities as to the dangers of pollution by sewage and the dangers attendant thereon. It is possible, however, to protect swimming tanks by the carrying out of simple, mechanical and chemical processes, which tend to reduce the bacterial content of the water used. Levine (*Journal of Infectious Diseases*, Vol. 13, No. 3) calls attention to the fact that continuous filtration of pools effects only a moderate reduction of the bacterial count. With continuous filtration and without disinfection, the sanitary condition of the pool, as indicated by the total and *B. coli* counts, is apparently more satisfactory when the temperature of the water is below 74 degrees Fahrenheit than when it is above



this temperature. The warmer the water, the less effective is the disinfection.

It is obvious that under ordinary climatic conditions in the summer time, together with the warm temperatures ordinarily maintained in the rooms where bathing pools exist, make it necessary that filtration should be supplemented by some other form of disinfection. Even the bathers are obliged to take shower baths before entering into the plunge, they are constantly introducing pollution and possible infectious material while in the pool. If disinfection has been practiced so that the pool is sterile at the time of the entrance of a number of bathers and the disinfectant process is not continuous during their presence there, the pool becomes seriously infected during the bathing hours.

Calcium hypochlorite is a cheap disinfectant and its value has been recognized by many sanitarians, particularly because of its value in water purification. It is used in the proportion of one-half to one part per million available chlorine two or three times a week. The germicidal action of the chlorine is very prompt but this action is rapidly lost and within 24 hours after the introduction of hypochlorite, the number of bacteria begins to increase. Clark and Gage found that even the daily application of hypochlorite in swimming pools kept the bacterial counts low for the first few weeks only and constantly increasing amounts of the disinfectant was necessary thereafter. They conclude that the occasional or regular disinfection with hypochlorite at intervals of several days can not be relied upon to maintain water at low bacterial content. A bathing pool is not a water supply in the ordinary sense, in that the latter is protected against pollution after the hypochlorite treatment, while the swimming pool is constantly receiving additions of infectious material. Incidentally, the bleach is irritant to the eyes and possibly harmful to the teeth and for these reasons, it should not be employed for the continuous disinfection of swimming pools.

Copper sulphate is an efficient germicide. Manheimer, Stokes and now Levine report the advantages of copper sulphate as a germicide, whose action is slower and more continuous than that of calcium hypochlorite. Copper sulphate added in the proportion of one part per million three times

a week to the filtered water of a bathing pool suffices to keep the swimming tank in good sanitary condition for several months. It should be added just before the pool is opened for use and its maximal efficiency is thus exerted, owing to its slow action, during the period of maximal pollution. It is exceedingly cheap, is non-irritating, slow in action, and more serviceable for continuous disinfection. Levine, in reporting his experiences in the pools of the Iowa State College with continuous disinfection, filtration and disinfection, with calcium hypochlorite, and filtration and disinfection with copper sulphate, shows that copper sulphate is distinctly superior to calcium hypochlorite as a disinfectant for swimming pools.

This study is of vital importance. No one gainsays the importance and necessity of pool disinfection. During the summer months, with high temperatures and increased use, these methods become essential and vital sanitary processes for the protection of the health and welfare of the bathing public. The hypochlorite method, which up to the present has been most largely employed, has been based upon an incorrect analogy. The purification and continued purification of a swimming pool is not analogous with the purification of a water supply which is not subject to further pollution. It, therefore, becomes necessary for those interested in the protection of the public health to readjust their methods of pool disinfection, so as to apply a type of chemical disinfectant which is slow acting and will serve to exert its protective influences during the time that infectious material is being added.

Up to the present time, copper sulphate appears to be the most satisfactory chemical agent thus far devised. In waters that are hard some other change may be necessary in order to secure its full effectiveness, but as Thomas has pointed out, a hard water may be softened by treatment with alum and mechanical filtration and then it is more effectively disinfected by copper sulphate than by hypochlorite.

Experiments to verify the value of copper sulphate might well be undertaken during this summer. It requires small laboratory facilities to make the necessary tests to determine the efficiency of various types of water disinfectants. It is to be hoped that

the value of copper sulphate will be corroborated and that bathers may be assured of greater protection from respiratory, intestinal and the other infectious diseases that may be acquired during the use of a popular swimming pool.

**Clean Foods.**—Infection of foods may be brought about by many and diverse means. Thus many things like fruit or bakery stuff may be infected in the course of handling, or by allowing them to be exposed to dust and dirt without adequate protection. Of all articles of diet, however,



milk is probably the most liable to infection or contamination.

Milk, as it comes from a healthy and perfectly clean cow, may be regarded as a sterile fluid. To obtain milk under these ideal conditions, however, is not only difficult, but almost impossible. Disease in cows is frequent, particularly if stall fed, and may be either general, or local in the udders. Tuberculosis is an especially common bovine disease and milk direct from a cow thus afflicted is generally believed to offer a special menace, particularly to infants. Far more commonly, however, milk becomes contaminated or infected by the introduction of foreign matter in the course of the handling that is necessary from the cow to the consumer.

Milk has been found to be an excellent culture medium for bacteria and many epidemics of typhoid fever, scarlet fever and other infectious diseases have been traced to infected milk. These facts are too well known, however, to require reiteration, and the question of milk infection and pollution, as well as the best methods for preventing the same, have been so repeatedly dealt with at length in the columns of this, as well as many other journals, that extended reference is unnecessary at this time.

In regard to the danger of spreading infection by the agency of meat, there is neither the weight of evidence nor the unanimity of opinion that exists in respect to milk. Indeed some authorities hold that even though meat may be frequently in-

fected, and under these conditions far from wholesome, it rarely if ever spreads infection—and certainly will not do so if well cooked.

Hutchinson in particular thinks that the prejudice against the use of the flesh of animals that have died from disease, as human food, can hardly be justified on the ground of either science or the available evidence. Nevertheless, there are abundant reasons for preferring the flesh of healthy animals for food purposes, and there can be little doubt that it is more wholesome and safe than meat from diseased animals. Moreover, meat, as well as other food stuffs, if exposed to uncleanly surroundings may become contaminated and dirty, and although in this condition it may not be actually diseased it certainly cannot be considered a safe and healthy food. Therefore in the handling of meat, it stands to reason that every effort should be made to protect it from contamination, and to this end the laws and regulations in this direction require the most strict enforcement.

Slaughter places and meat in transit should be carefully supervised, and butchers' shops, above all public stores, should be kept scrupulously clean. Failure to do this cannot help but react on the butcher himself, because putrefactive bacteria when allowed to make the slightest headway very quickly make their presence known.

Sausages, owing to their extremely uncertain composition offer a special problem. It has been remarked of them with some truth that they are like life—"you never know what is in them until you have been through them." Therefore, it is not surprising that sausages, as a rule, have long been regarded with a certain amount of distrust. Recently our inspection laws have been more thoroughly enforced, and there is a growing sentiment that meat from cattle that have been well inspected, and the contamination of which has been carefully guarded against from the time the animal is killed to the time it is taken to the kitchen in which it is to be cooked, offers little danger from the standpoint of infection. Private slaughter houses should be abolished because of the obvious difficulty in supervising them, and strict observance paid to the law that every carcass on removal from a slaughter house, if conveyed in the open for any distance, must be suitably and adequate-

ly covered. Similar regulations should be enacted to protect all other articles of food from being exposed in the open for any length of time, for although infection may be rarely conveyed thereby, much dust and dirt are often collected, and it is never possible to tell what consequences may result from the ingestion of such material. It is a rule that requires no argument that foods of all kinds should be so handled that they come into the hands of the consumer as clean and free from contamination as possible. That the commercial possibilities of presenting food stuffs in a way assuring their cleanliness and freedom from contamination have been recognized, is shown by the reported organization of a firm that proposes to market all supplies in sealed packages. Exceptional care is to be taken to avoid as far as possible all danger of contamination previous to sealing, as well as during the handling incidental to the process of packing. Whether the dangers from food stuffs marketed in bulk or "loose form" are sufficiently feared, or the advantages from sealed packages are sufficiently pronounced, to make the public willing to meet the necessarily increased cost, the course of events alone can demonstrate. The true sentiment of the people relative to this matter of clean foods will soon be learned when they are confronted by the additional cost of precautionary measures. If they are willing to pay the cost, it will be amply evident that they feel that the dangers are real, and the benefits from safety procedures substantial and warranted. On the other hand, if the people refuse to pay the increased cost occasioned by the special precautions and greater care involved in the sanitary handling of foods plus that incidental to special containers, sealing up, etc., and persist in buying from bulk or "loose" lots, only one conclusion will be justifiable, that the dangers from food contamination are discounted and the benefits of cleanliness not considered "worth the price." At any rate it is certain that the whole question of food selection and food handling will receive much more concrete thought than ever before, and it is a pretty safe conclusion that when the people begin to think in a special direction, needed reforms and improvement are sure to follow.



Conducted under the Editorial Direction of  
Dr. John W. Wainwright.

**Antimony in Emesis, Pilocarpin as a Diaphoretic.**—H. C. Wood, Jr., (*Journal American Medical Association*, April 8, 1916), in a paper discussing pharmacologic superstitions says that antimony will produce emesis or pilocarpin increase the secretion of sweat with such infallibility that even the prejudiced observer could not fail to connect cause with effect; but that the question of whether the emetic effect of antimony is beneficial in pneumonia, as the ancients believed, or whether the diaphoresis produced by pilocarpin is useful in uremia, as we believe, requires nicer discrimination and cannot be answered dogmatically. He declares that the commonly accepted theory of uremia is that the symptoms are caused by the retention of some poison in the system, and that by the use of eliminants we bring about the excretion of this poison through other channels. After all, however, it cannot be considered as proved that the uremia is due to retention of a poison and that our theories that purgation and sweating are capable of carrying off this poison are certainly not positively established. But because of our belief in the pathogenesis of this condition, and our faith in the effect of eliminating measures, we persuade ourselves that we see beneficial effects from such treatment.

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**Tincture of Ferric Chloride in Treatment of Burns.**—Slack, (*Journal of the Georgia State Medical Association*, March, 1916), declares that the immediate application of tincture ferric chloride is in his experience the best treatment for burns. He advises to paint the entire surface over with the tincture several times with a cotton applicator or camel's hair brush, being careful not to rupture the blisters in the

second degree burns or to remove the charred surface in those of the third degree. He then applies a dry gauze dressing. There is at first increase of pain, but he continues the application and finds that it soon ceases. The author declares that he has used this treatment for over twenty years.

**Vaccine Therapy in Typhoid.**—Bosilli (*Policlinico*, August, 1915), relates his experiences with the treatment of twenty cases of typhoid. The vaccines were prepared according to Löffler's method used intravenously, and those prepared by the Pfeiffer-Kölle plan and used subcutaneously in seven cases each, and sensitized vaccine prepared by the Besredka method in six cases. In seventeen of the cases vaccination was begun between the seventh and twelfth day of the disease, while in the remaining three cases, treatment commenced between the fifteenth and eighteenth days. The mortality for the whole number of cases was 20 per cent while relapses occurred in 15 per cent. The author's treatment was carried out during a very severe epidemic, while the course of the disease resembled cases treated by other methods. He concludes from his experience that vaccine treatment does not shorten the febrile period or lessen the severity of the disease.

**Pituitary Extract in Obstetrics.**—Macfarlane writing in the *Glasgow Medical Journal* for September, 1915, states that the most marked benefit from pituitary extract is obtained in the second stage of labor. His observations showed, however, that when the uterus is exhausted, it must be rested before pituitary extract is given. Since the degree of action varies in different individuals, it is best to begin with a small dose and repeat frequently, as required. The marked and prolonged contractions excited by this agent scarcely admit of postpartum hemorrhage unless it be from a lacerated cervix. Then occurs, however, more bleeding than normal after placental expulsion, if pituitary extract has been used. This can be controlled by giving

a small dose of pituitary immediately after the placenta has appeared. Contraindications are anemia and obesity—in the presence of which sudden blanching and faintness may occur—chronic renal disease and arteriosclerosis, marked pelvic contraction and rigid cervix. Uterine contractions stimulated by pituitary extract, become less severe but not less frequent when chloroform is administered in the latter part of the second stage.

**Radium in the Treatment of Carcinoma of the Cervix Uteri.**—Miller, (*Surgery, Gynecology and Obstetrics*, April, 1916), makes the following report on the use of radium in carcinoma of the cervix. Radium, he declares, has no field absolutely to itself, but is merely a therapeutic agent which should be used in common with other established methods of treatment. He believes that we have about reached the limitations of operative technic in cancer eradication. No one ventures further than the present established technic of breast amputation or radical hysterectomy. If we are to increase our percentage of ultimate cures, it will be by earlier operation or by combining other therapeutic agents with surgery. Radium has been lauded in the highest terms as a cure by some, abandoned as useless by some, and denounced without trial by others. Neither of these attitudes is a fair one. Miller praises the benefit of radium in inoperable cases, to check discharge, relieve pain, stop hemorrhage and as a deodorizer, believing it far more satisfactory than any other means known at present. He does not believe in preliminary cauterization and anesthetization before radiation in inoperable cases, because little or no advantage is gained, rather more often harm than good results.

**Acidosis in Children.**—Howland and Marriott, (*Bulletin Johns Hopkins Hospital*, March, 1916), declare that acidosis may often be found when no evidence can be detected pointing to its cause. They state that acidosis is not an uncommon condition in infancy or childhood.

That it is especially frequent in the severe diarrhea of infancy and that it may also appear with a variety of diseases and sometimes alone. It is not so difficult to recognize acidosis in older children, but its detection in infants is not so easily determined. Older children react promptly and often permanently to alkali therapy. In infants, however, acidosis is often a fatal complication.

It is important to give sodium bicarbonate from the beginning of severe diarrhea in infants in sufficient quantity to render the urine alkaline and keep it so. Generally, hyperpnea indicates acidosis, therefore hyperpnea calls for alkali therapy for both infants and children. The alkalies may be given by mouth, rectum, subcutaneously or intravenously. Vomiting and diarrhea frequently render administration by mouth or rectum out of the question in which case either one of the other methods can be adopted. The intravenous is the method of choice. A 4 per cent solution of sodium bicarbonate is usually employed for intravenous use, a 2 per cent for subcutaneous use. The quantity used depends upon the size and age of the child, the severity of the symptoms and the effect produced. The amount should be large and given until the urine becomes alkaline; infants under one year old can be given 10 grams in twenty-four hours.

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**Use of the Gynocardates in Leprosy.**—Rogers, (*London Lancet*, February 5, 1916), writes that his investigations concerning the value of gynocardic acid and the gynocardates in the treatment of leprosy demonstrated pronounced improvement in three patients, large quantities being given by mouth without disturbance. The treatment continued for over a year or two. Gynocardic acid was given by mouth in doses up to 40 grains a day, but could not be used hypodermically, because of its insolubility. The soluble sodium and potassium salts were tried hypodermically, the dose being from one to two grains twice weekly, continued for long periods with extremely favorable results. Anesthesia was greatly diminished within two months, while heat, cold and tactile sensation re-

turned, muscular power improved, and the nodular skin and nerve lesions almost entirely disappeared.

Rogers is not prepared to state definitely the degree of beneficial action of the gynocardates or the permanence of their beneficial effects.

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**American Digitalis.**—Rowntree and Macht, (*Journal American Medical Association*, March 18, 1916), using Hatchers method of standardizing digitalis, found that different samples of infusion varied widely in activity, depending on the samples of leaf and the mode of preparing the infusion. American, English, and German leaves of high quality were compared; domestic leaves were the most active. They believe that the standardization of digitalis for clinical use is necessary, and that American leaf is superior to the foreign.

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**Treatment of Malignant Tumors with Selenium Compounds.**—Coenen and Schielemann, (*Deutsch Med. Wochenschrift*, October, 1915), report giving intravenous injections of Wassermann's eosin-selenium, a combination of sodium-eosin and selenium-potassium cyanide, to rats and mice in which they had developed carcinoma and sarcoma. In some of the cases they noted changes in the tumors due apparently to what they describe almost a specific effect of the compound on the blood vessels of the growth.

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**Embarin in Sympathetic Ophthalmitis.**—Hirsch, (*Medizinische Klinik*, January 30, 1916), reports on the use of embarin, subcutaneously injected, as the most satisfactory treatment for this condition. If begun promptly on the first signs of sympathetic involvement of the sound eye it is capable of preventing destruction in a large proportion of cases. Embarin is a mercurial compound suitable for hypodermic administration.

**Pituitary Extract—A Life Saving Drug.**—Although pituitary extract has become almost as well established in modern therapeutics as adrenalin, it is doubtful if even yet its great value is realized. The records of over 1,000 doses given by Hingston in the Government Maternity Hospital at Madras (*Indian Med. Gazette*, March, 1916) furnish some highly interesting facts, not the least significant of which are those having reference to the decrease of danger to the child and mother that follows the use of pituitary extract. Thus the records of the past two years show that no death has occurred in cases in which pituitary extract and small doses of morphin ( $\frac{1}{4}$  grain) or pituitary extract and chloroform have been administered. No deaths have occurred after the injection of pituitary extract and large doses of morphin (1 grain), but in these cases some difficulty has been experienced in inducing natural breathing in the infant. No children have been lost in these cases. Hingston insists that scopolamin should not be given when pituitary extract is used, as the child may not survive and will certainly be born in a poisoned condition. Two infants were lost; although the heart beat strongly for more than an hour respiration could not be induced even with Sheil's fluid. Pituitary extract administered with small doses of morphin,  $\frac{1}{4}$  grain, repeated once or twice, has been found to be a great success, but Hingston considers that the best method is to give pituitary extract injection in combination with chloroform inhalation.

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**The Physiology and Therapeutics of the Corpora Lutea.**—The following very concise resume of the facts established by recent clinical and experimental investiga-

tions regarding the function and therapeutic action of corpora lutea is taken from *Therapeutic Notes* (1915, xxii, p. 31):

The human ovary has an internal secretion. This internal secretion controls menstruation and maintains pregnancy during the early months.

The corpus luteum is the structure concerned and seemingly the source of the internal secretion.

The corpus luteum of pregnancy is more stable than that of ovulation.

The corpus luteum has a selective action on the endometrium and prepares the uterine mucosa for the reception of the ovum.

The development of the corpus luteum is synchronous with the onset of menstruation.

A relation exists between the corpus luteum and the other internal secretory structures of the body.

Removal of the corpus luteum causes cessation of the menstrual function.

Animal corpora lutea, when administered by the mouth in average doses, are non-toxic.

Those who have employed corpus luteum (the fresh yellow body) or a desiccated extract of it, using proper discretion, have found out that it is much more potent than gross ovarian preparations, and that its administration in suitable cases is followed by striking and gratifying results.

The particular conditions for which extracts of the corpus luteum will be found serviceable are:

1st, Functional amenorrhea or scanty menstruation; 2nd, Dysmenorrhea of ovarian origin; 3rd, Manifestations of the physiologic or artificial menopause, such as nervous or congestive disturbances of reflex origin (hot flashes, psychoneuroses, etc.); 4th, Neurasthenic symptoms, during menstrual life; 5th, Sterility not due to pyogenic

infection or mechanical obstruction; 6th, When the function of one ovary is impaired, or one ovary has been removed, and the compensatory activity of the other is insufficient; 7th, Repeated abortions not due to disease or mechanical factors; 8th, Hyperemesis in the early months of pregnancy.

disorders bear an etiological relation to myopathy or are secondary to it, or whether both are due to a common cause, it is true nevertheless that the combination is too frequent to be regarded as a mere coincidence.

**Muscular Disorders and Their Relation to the Internal Secretions.**—For some time there has been a growing conviction that the etiology of not a few of the obscure muscular disorders like progressive muscular dystrophy, myasthenia gravis and certain of the myopathies will sooner or later be found in some derangement of the internal secretions. McCouch and Ludlum review (*Medical Record*, June 10, 1916), what is known of the relations of myopathy and other muscular disorders with internal secretion disturbance, and reach some highly interesting conclusions. Thus these writers say that there is fairly definite evidence that thyroparathyroid deficiency may have some etiological relation to myotonia. They also point out that myasthenia is frequently associated with hyperthyroidism, and probably with hyperactivity of the thymus. Hypothyroidism and pathological findings suggesting both hypo- and hyperactivity of the thymus have been noted in amyotonia. Myopathy is known to occur in association with many disorders of internal secretion, perhaps most frequently with hypopituitarism. The authors report a very interesting case which gives the fully developed picture of both dystrophia adiposa genitalis and the fascio-scapulo-humeral type of progressive muscular dystrophy. Abderhalden tests on a series of four cases of myopathy, one case of neuritic muscular atrophy, one case of spinal muscular atrophy, and two cases of muscular atrophy from syphilitic root neuritis showed hyperactivity of thyroid, thymus, and adrenal in the first three conditions. In the peroneal case hyperactivity of testis was also noted. The tests on the syphilitic cases were negative. Thyroid and thymic hyperfunction are frequently observed in hypopituitarism.

McCouch and Ludlum well say that while it is uncertain whether the glandular

**The Ductless Glands in Dysmenorrhea.**—It may be recalled that reference was recently made to the position taken by Professor Dalché in regard to the relation of the thyroid to dysmenorrhea in young women. He has treated many cases with very satisfactory results by giving thyroid extract. Now come two other French clinicians MM. Siredey and Lemaire (*Paris Médical*, April 25, 1914) who consider various phases of dysmenorrhea in older women including that which not infrequently occurs at or near the climacteric. In the majority of women at this age the disturbances are due to lack of equilibrium between the various internal secretory organs, and are principally found in individuals of a neuroarthritic type with a tendency to obesity, disturbances in the thyroid gland, both deficiency and excess, slight pituitary insufficiency and adrenal overactivity. Hypothyroidism, however, is by far the most frequently condition, and in the opinion of the above writers, pluriglandular therapy is indicated. The administration of combination of thyroid, ovaries and perhaps pituitary gland not only reduces the attacks of pain, but also favorably influences the reduced metabolic activity and with it the obesity. Special stress is laid upon the advantage of combining with this medication an antitoxic diet in which animal products are reduced; and alkali diuretic medication is given.

It is surprising how many reports are being published which clinically prove that pluriglandular therapy is more effective in many conditions than the use of single gland extracts and probably this is more true in the genital disturbances of women than in any other single class of cases. Small doses suffice: for example,  $\frac{1}{4}$  grain each of thyroid extract and pituitary extract and three to five grains of corpus luteum given together three times a day, preferably between meals.

**Adrenal Substance in Hypothyroidism.**

—Not infrequently it is possible to bring about favorable changes in the treatment of a given endocrinous insufficiency by the administration of a gland substance other than that which seems to be directly indicated. The reason for this lies undoubtedly in the close relationship between the glands of internal secretion and the interaction of their respective hormones.

Recently Scott (*Jour. Med. Soc. of New Jersey*, March, 1916) suggests the use of desiccated adrenal substance on the principle that as hypothyroidism is usually associated with hypotension, the adrenal substance may help to overcome this. He tests the blood pressure frequently, both before and during the course of treatment. Scott's dosage, which in the estimation of the writer is unduly generous, consists of ten grains of the adrenal substance and five grains of thyroid daily, in divided doses. Rarely is it necessary to give five grains a day of thyroid (U. S. P.). Perhaps in this instance Scott used the Burroughs, Wellcome & Co. product in which event a five-grain tabloid represents only 1 grain of the standard U. S. P. thyroid extract. (See "A Warning about Dosage," AMER. MED., Nov., 1915, p. 848). This is a normal average daily dose of thyroid in cases of minor thyroid insufficiency and from 1 to 3 grains of adrenal gland, three times a day, should suffice to produce the therapeutic effect of this remedy.

**PRACTICAL POINTS.**

**Menstrual Psychic Depression**, that mental state which not infrequently accompanies the periods, is often relieved by thyroid substance.

**Depression at the Climacteric** may be due to an associated thyroid inadequacy and the best clinical proof of this follows a short course of thyroid medication.

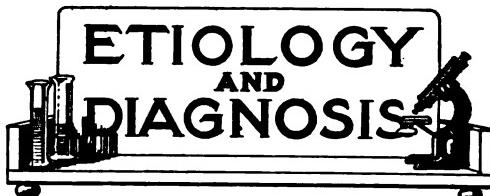
**Vomiting in Graves's Disease.** For the persistent vomiting of hyperthyroidism pituitary liquid is sometimes of great value (Murray).

**Stimulating the Thyroid Gland.**—"The alternative action of arsenic and the iodides depends upon the power these possess to activate the thyroid hormone." (Clow).

**Pituitary Hyposecretion.**—Look for dry, smooth skin; adiposity; reduced sexual activity (amenorrhea, impotence, etc.); malformed teeth; eyes close together; subnormal temperature, pulse and tension.

**Pituitary Hypersecretion.**—Look for a large frame; broad face with eyes wide apart and a square jaw; much hair; large broad and irregular teeth; excitable temperament; sexual development and irritability plus; polyuria with occasional glycosuria and high blood pressure.

**Preventing Bromism.**—When it is necessary to administer bromides, as in epilepsy, Sicard shows that thyroid gland,  $1\frac{1}{2}$  grains per diem, for some weeks with intervals during which it is omitted, exerts a marked effect in preventing the untoward symptoms of bromism.



**Diagnosis of Gastric Cancer.**—Sears in *Northwest Medicine*, February, 1916, concludes an able paper with these valuable diagnostic points:

(1) It is possible to diagnose cancer of the stomach earlier than is now being done and at a time when it will be possible to do something for the patient.

(2) It is not possible to diagnose ulcer from cancer, by gross appearances at the operating table, better than by clinical examination; hence all ulcers should be submitted to microscopic examination when possible during or after operation.

(3) There are four factors which play the chief roles in the hopelessly late diagnosis.

(a) Patients disregard too long symptoms that are not severe before accepting or demanding a thorough examination.

(b) Incomplete examination and observation of patients presenting themselves with those symptoms.

(c) Lack of familiarity with and import-

ance of the means of diagnosis which we now possess. Hence what we need at present is not newer methods of gastric diagnosis but an earlier application of those we now have to the apparently mild but protracted and recurring gastric disorders.

(4) The latency of cancer is often more apparent than real.

(5) The most constant signs of cancer of the stomach are: (a) occult blood; (b) X-ray manifestations; (c) indican in excess in the urine.

**Failures in Diagnosis.**—Gordon in the N. Y. *Med. Jour.* (June, 1916), says in his valuable article that, summing up, we may state that the chief causes of errors or failures in diagnosis are:

Ignorance or neglect on the part of the physician.

The partial or incomplete employment of the aids afforded by science.

The failure to make routine examinations.

The failure to correlate laboratory and physical findings.

Exceptions to the laws governing diagnosis and pathology.

The limitations of scientific knowledge.

The impracticability at times of using all of the diagnostic methods.

The failure of the patient to submit to the requirements of the physician.

The direct or indirect influence upon patient and physicians of the erroneous expressions of the laity.

As members of a profession imposing great responsibilities, we should be willing to confess, and endeavor to correct our own faults; but we should not be held accountable for the faults of others or for the imperfections of the science whose progress it is our aim and duty to promote. That science is rapidly advancing in all of its branches. Diagnosis is becoming more and more accurate, while the doctor is becoming more highly educated. When the public awakes to a realization of the many difficulties which beset the pathway of the medical man, and when it ceases to place him on a level with the charlatan, it will be surprised at the comparatively few mistakes which the physician makes and at the large number of successes which can be placed to his credit. *Sic itur ad astra* could apply to medical science, but the journey will be easier and more rapid when the obstacles of ignorance, superstition and prejudice are removed.

suggest typhus. In typhoid and paratyphoid the patient has no difficulty in putting out the tongue, but in cases of typhus he is quite unable to project it beyond the teeth. It is retained at the base of the palate and appears to be drawn towards the pharynx. Sometimes there is also a slight trismus caused by contraction of the masseters, producing a difficulty in speaking almost comparable to that present in tetanus. During a residence of three years in a town where cases of typhus were by no means rare, Remlinger has not seen a single exception to this sign. He points out that in standard books no mention is made of this sign, but he quotes five authors who are writing of cases actually under observation, and who describe the sign as constantly met with in typhus, so that it cannot be said that the sign happened to be present in this series of cases, and was not likely to be met with elsewhere. The sign is of great value where rapid diagnosis is necessary and laboratory facilities are lacking.

**The Tongue in the Diagnosis of Gastric Diseases.**—According to Douglas V. Hoof there is but one condition of the tongue from which any conclusion can be reached as to the state of the gastric secretions, viz., the bald, red, and often glazed tongue seen in many cases of gastric anacidity—often erroneously ascribed to gastric states associated with excessive hydrochloric acid secretion. In a series of 1,500 cases, the author found the tongue coated in sixty-five per cent. of cases of normal gastric acidity, subacidity, or anacidity, and in seventy-two per cent. of cases of hyperacidity. In the diagnosis of gastric diseases, practically no significance can be attached to the appearance of the tongue. Common causes of coated tongue are nasal obstruction (including that of febrile conditions), absence of friction (due to liquid diet, hurried eating, or a high, arched palate), and perversion of the salivary secretion. The treatment of coated tongue consists in removal of the cause, whatever that may be, and removal of the accumulated epithelium and fungous growths constituting the "fur" by means of a small silver hoe, a procedure first recommended by Oliver Wendell Holmes.



**"The Sign of the Tongue" in Typhus Fever.**—Remlinger in *Paris Medical* (January 8th, 1916), says that the sign is of importance in the differential diagnosis between typhus and typhoid or paratyphoid fever, especially in those cases of typhoid where the suddenness of onset, confluence of rose spots, intensity of headache, and pain in the back, with constipation,

**Accidental Discovery of a Possible Cure for Pellagra.**—Cole (*Southern Medical Journal*, May) tells how a woman whose children had both round worms and pellagra, gave them a vermicide, the nature of which she did not know, which cured the pellagra at the same

time that it removed the worms. He suspected that a cure had been accidentally effected by sweeping out the intestinal tract and freeing it from pellagra germs along with the round worms, and tried out the result of his reasoning in an apparently hopeless case of pellagra in a boy eight years old, by giving him three grains of calomel, three of soda, and one of santonin at bedtime, followed by castor oil in the morning. The feces were found to abound with motile intestinal bacteria that indicated a very polluted condition of the intestinal tract. No blood appeared in the stools after the second day, and the general condition began to improve. Medium doses of calomel and soda followed by oil were given frequently for several weeks, and the boy recovered. Cole believes pellagra to be an infectious epidemic germ disease, that it is not contagious, and that the infection enters through the digestive tract. He suspects the agent to be a protozoon similar to the plasmodium of malaria, and thinks that it probably attacks the liver, pancreas, and other glands, at an early stage, crippling metabolism and the chemistry of the body, and causing profound derangements of the digestive and nervous systems.

**Prolonged Rest in the Treatment of Heart Disease in the Young.**—Barton in the *British Journal of Children's Diseases*, contributes a paper which is based upon five years' results of a cottage home for the treatment of valvular disease in boys. It has been found that if the heart lesion has been brought on by chorea the cases do not do so well as those where valvular trouble due to acute rheumatism is being dealt with, and this may be attributed to the impossibility of keeping the boy quiet enough with other boys playing around him. The cases where compensation has hopelessly broken down begin with a month in bed—perhaps two or three months. When the boy begins to get up he starts making wool mats, rugs, etc., which gives him an interest and keeps him employed. Later, when he can walk half a mile or so, he earns a little money by cleaning brass work at one of the private houses near by, and later still he goes out for the whole morning as boot-boy, cleans bicycles, etc. Then, if he likes private service, a permanent situation is found for him. The success in the majority of cases appears to be due more to prolonged rest, good food and country air than anything else, digitalis and other heart drugs being occasionally required.

**Sodium Bicarbonate in Hay Fever.**—Kellogg, (*N. Y. Med. Jour.*), writes that acting on the theory that the symptoms of hay fever are due to a general acidosis, he has been treating the complaint with large doses of sodium bicarbonate, one dram three times a day. Reviewing his records he finds that 90 per cent. of his patients experienced marked amelioration of

symptoms, and 70 per cent. complete relief after a few days' treatment. The remaining 10 per cent. were not as fully benefitted, although they showed some improvement.

**The Treatment of Gall-Bladder Disease With Alkaline Waters.**—The treatment of gallstone and liver disease with the mineral waters, says Lerch (*Medical Record*, Sept. 25, 1915) has stood the test of centuries, and an army of sufferers travel annually to the famous springs of Europe and of this country for relief. The numberless cures reported from these watering places testify to the efficiency of the waters and leave no room for doubt. There can be no question, however, that the change from a sedentary indoor life, with the worry and care attached to the daily occupation, to a life in the open, free of care and worry, full of hope to regain health, with regular hours and a suitable diet prescribed by a skilled physician, have much to do with these cures. Nevertheless, the waters have therapeutic properties. They represent an alkaline solution which, given warm or hot one hour before each meal, bathes the mucous membrane of stomach and intestines, frees it from mucus, stimulates peristalsis, and subdues inflammation. During their passage through the gastrointestinal tract some of the mineral water is absorbed and increases the fluidity, quantity and alkalinity of bile. It seems to be rational that a blood richer in water and alkalies produces such changes, though experiments have not shown a direct influence upon bile formation.

**Serum Sickness in a Series of Five Hundred Patients Treated With Diphtheria Antitoxin.**—In the *Archives of Internal Medicine* of January 15, 1916, Sturtevant reaches these conclusions:

1. A varying proportion of patients receiving modified horse serum react with rash and other symptoms. The larger the amount of serum the larger the number reacting.
2. Most patients react from the fifth to the ninth day, though reaction may take place from the first to the seventeenth day and perhaps later. The time of reaction has no relation to dosage.
3. Rash may be erythematous or urticarial. The larger the dose the greater is the proportion of urticarial rashes. Vesicular urticaria is sometimes, though rarely, seen.
4. Nausea and vomiting occur in about one in five reacting cases. It is more likely to occur and to be severe and prolonged if the dose of serum is increased.
5. Albuminuria and edema occur occasionally, either together or independently.
6. Joint symptoms occur in about 14 per cent of reacting cases and may be severe.
7. If a given amount of serum be given in two or more doses, it seems not less likely to produce reaction than if given in one injection.

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# American Medicine

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**Standardized Accident Rates.**—Vital statistics to be of service must consist of more than a systematic organization of facts in numerical proportions. They must be constituted of items capable of interpretation so as to get a true picture of underlying conditions. Accident statistics for example, are in an unsatisfactory state. To tabulate figures showing the number of accidents per thousand workers is of indefinite value unless one knows the meaning of the term "thousand workers."

The United States Bureau of Labor Statistics seeks to establish a new method of computing accident rates. In the *Monthly Review of the Bureau of Labor Statistics*, July, 1916, a full-time worker is defined as one who works 10 hours per day, or 300 days per annum, or 3,000 hours per annum. This represents for statistical purposes a standardized workman who can serve as a unit of measure. The accident rate of 72 per thousand employees is indefinite because of the variation of the daily number of employees, the difference in the length of working days in various industrial plants, and the variation in the number of days the establishment is in operation. It is reasonably accurate to ascertain the hours worked in a year and to convert this figure into full-time workers by dividing by 3,000 hours. An accident rate of 72 per thousand full-time workers would give a reasonably accurate frequency rate.

For interpretation of the meaning of the accident rate, it is obvious that accidents should be weighted according to their importance. The recording of time loss is far more satisfactory than wage loss or compensation paid, owing to the variations in the latter in different industrial organizations. In the case of a fatal injury, obviously, the theoretic time loss to the family and society is the expectancy of productive working life of the deceased workman. From studies made in Wisconsin and other states, the average age of workmen killed is approximately 30 years. The life expectancy at age 30, according to the American life tables, is 35 years. It is admitted that the expected productive life of workers is shorter than their life expectancy, but at the present time it seems fair to estimate the working time lost as a result of fatal accidents at 30 years, or 9,000 working days, counting 300 working days of 10 hours each to the year. This is not mathematically accurate, but it is an excellent approximation and suffices for comparing the accident records of one year with those of another.

**Differentiation between fatal, serious, and minor accidents** becomes essential. Permanently total disability is a greater burden to relatives and a community than death itself. Because of this, the time lost for permanent total disability has been fixed at

35 years or 10,500 working days. The estimation of the allowance necessary for permanent partial disabilities is, needless to say, difficult. Experience gained under compensation acts suggests however, a method for estimating the time loss resulting from permanent partial disability. All compensation acts agree that the loss of an arm is the most serious injury less than total disability. The New York State Compensation Act grants compensation for 312 weeks or 1,872 working days for the loss of an arm. This is only about 18 per cent of the time loss fixed for permanent total disability. This would seem to be an underestimation of the seriousness of the loss of an arm. Increasing the New York scale by 50 per cent gives 468 weeks or 2,808 working days for the loss of an arm or 20 per cent of the time lost for permanent total disability. The Bureau of Labor Statistics accepted 27 per cent as representing the degree of disability resulting from the loss of an arm as compared with permanent total disability. They then increased the figures outlined in the New York State Employment Act for other disabilities by 50 per cent for the purpose of computing accident rates in terms of time lost.

Temporary disabilities are readily rated according to the actual number of work days during which incapacity continues.

Multiplying, therefore, the number of deaths and permanent disabilities by the time loss determined for each and adding thereto the number of days lost through temporary disabilities, one obtains a figure representing the total days loss from injuries. Dividing this total number of days lost by the number of standard full-time workers results in a quotient indicating the average number of days lost for a full-time worker. This figure may be called the

accident severity rate, revealing, as it does, the seriousness of the accidents analyzed.

It is patent that the accident rate per thousand full-time workers does not fully expose the hazards in industry in so far as severity of accidents is involved. It is possible, comparatively speaking, to have a low accident rate and a high accident severity rate which would change one's estimate as to the real hazards in the industry. To illustrate, of two industries one may have an accident frequency rate per thousand full-time workers of 114.5 and the other a rate of 118. An analysis of the accident severity rate might show that the one with the lower accident frequency rate had an accident severity rate of 21.2, while the other one had only an accident severity rate of 5.6. It is at once apparent that for the determination of the relative hazards of these two industries, the severity rate affords a more accurate standard than the frequency rate.

All of this may seem to be dry reading, but it is of the utmost significance if we are to have an intelligent understanding of the meaning of statistics relating to industrial accidents. It should in a sense establish a basis of measurement which will enable employers, employees, prospective workmen, legislators, and the community at large to appreciate approximately the relation of industrial organization to the physical welfare of the community. It should provide legitimate units of measurement serviceable for the relative estimation of the hazards in totally different industries. It may, in the minds of some, afford merely cold mathematical computations, but to the thoughtful student of industrial accidents the figures will tell a story teeming with human interest and human welfare.

**Three Million Luetics.**—Propagandists for the elimination of venereal diseases have been accustomed to make use of various statistics to indicate the wide distribution of syphilis. Guesses, estimates, and approximations made before the Wassermann test was introduced possess merely the argumentative force of all other guesses, estimates and approximations. Syphiliographers had announced syphilis to be existent to the extent of 12 to 15 per cent of the population in large foreign capitals.

In this country the statistical evidence as to the prevalence of syphilis has only recently been placed upon a more scientific basis. Vedder (*Bulletin 8, The War Department*, June, 1915) in studying the prevalence of syphilis in the U. S. Army, estimated that 16.77 per cent of recruits are syphilitic at the time they enter the service. His conclusions were based upon Wassermann tests. Inasmuch as the recruits studied were picked adults from all the principal occupations, it is reasonable to believe that his figures represent one criterion for the existence of syphilis among vigorous male adults. Owing to the fact that many applicants were rejected for other reasons before Wassermann test was applied, Vedder estimated that "about 20 per cent of the young adult male population of the class from which the Army is recruited are infected with syphilis." From an investigation of the students at West Point, he reached the conclusion that about 5 per cent of the young men in our colleges are syphilitic.

**Tests for syphilis** applied to all patients admitted to Bellevue Hospital and to the Presbyterian Hospital of New York gave a percentage of 20 to 25 syphilitics. In the

Peter Bent Brigham Hospital in Boston, an institution without a service for venereal diseases, 15 per cent of the patients were found to react positively. Hospital figures of this character, of course, are unreliable and do not represent a cross section of the population.

The New York Health Department, in the study of men and women either awaiting trial or serving in a penitentiary, a work house or a reformatory, including, of course, a large number of prostitutes demonstrated 35 per cent to be syphilitic. No conclusion can be arrived at as a result of studies of the degenerate and criminal parts of a population.

Pollitzer (*American Journal of Obstetrics*, May, 1916) places particular value upon the result of examinations of applicants for peddlers' licenses in New York City among whom 8.2 per cent gave a positive Wassermann reaction. He makes due allowance for the fact that in any group under investigation many syphilitics may be Wassermann negative at the time of examination and arrives at the conclusion that "not less than 10 per cent and not more than 20 per cent of the population is luetic." After making due allowance for the fact that syphilis is more common among men than among women, in the ratio of 5 to 2, as evidenced by tests made upon applicants for treatment at dispensaries, he arrives at a ratio of syphilitics to the general population of approximately 10 to 15 per cent. Thus the scientific data is found to accord with the estimates made by syphiliographers previous to the availability of the Wassermann test. Accepting a minimum basis of 10 per cent of syphilis among adult males and 4 per cent among females, there would be a total of

about 3,000,000 adult syphilitics in the United States.

The authenticity of scientific estimates of this character is scarcely to be impeached. The gross figures, conservatively stated, are astounding and appalling. While unscientific estimations were the only available criteria, there was always a latent belief that these were beyond corroboration, were untrustworthy and merited prompt denial by those whose optimism and faith in the public morals led them to believe in their falsity.

**The problem of syphilis** now appears to be more serious. It is time that the truth was faced with frankness and determination. Legislation alone can not reduce the morbidity from syphilis. Contemplation of the enormity of the problem suggests that the solution can only be found in some fundamental and far reaching remedy. The utilization of drugs, either for prophylactic or therapeutic results cannot be depended upon as the primal agency in combatting this disease.

It is probable that medical schools and hospitals must reorganize their methods of instruction regarding syphilis and their plans for treating it. The symptomatology of syphilis should no longer be taught by the professors in several departments but the entire subject should be placed in charge of a single teacher, as is now being done at the University of Michigan. Hospitals must sooner or later recognize that their work is not complete when the syphilitic patient is relieved of his troublesome symptoms, but that there is responsibility for the cure of the constitutional infection after the proper diagnosis has been made. Wards for venereal diseases are a public necessity, as are clinics adequately

fitted for the treatment of this disease. Probably no part of our hospital or dispensary systems is so open to criticism as are their inadequate arrangements for the diagnosis, observation and cure of symptomatic and asymptomatic syphilis. The medical profession, at least, is in possession of the facts and should be the leader in promoting its own education for the palliation of this scourge, the elimination of which belongs to some Utopian period.

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**The Value of Dispensary Follow-Up Work.**—Dispensary service is rarely satisfactory as at present administered. Even with regularity of attendance of dispensary physicians the maximum result is not achieved owing to the lack of control over the dispensary patients. The private physician calls upon his patient as frequently as he may deem it necessary or the patient returns to his office for regular treatment.

It has long been known that the number of new patients in dispensaries is disproportionately greater than the total number of treatments would warrant. This is due to the fact that a large proportion of the patients do not return for the further treatment indicated. The reasons for this are numerous and the blame is divided between the dispensary and the patients. Day (*Boston Medical and Surgical Journal*, March 2, 1916) shows the advantage of following up dispensary patients with a view to carrying out the necessary treatment to restore the patients to normal.

Langstroth (*J. A. M. A.*, July 8, 1916) pointed out that as a result of his study he found only 51 per cent of the patients secured a diagnosis before the third visit to the dispensary. Thirty-eight per cent of

***THE SHADOW ON THE FLOOR.***

the patients failed to return for treatment after the diagnosis was made. He wisely comments: "The introduction of a follow-up system would decrease this percentage."

The follow-up system employed at the Boston Dispensary goes a long way in correcting the difficulties of insufficient visits and disregarded advice. To illustrate, before the follow-up system was instituted only 37.6 per cent of gonorrhreal patients made more than one or two visits. During the year of follow-up work, this number was raised to 76.5 per cent, and in the medical clinic before 51 per cent and after 94 per cent. These two figures indicate an immense improvement in the number of return visits, but what is more important are suggestive of the better service made possible for the patient and the greater protection to the public by virtue of more patients cured.

More striking is the result of the follow-up work in relation to advice. Before the social work was instituted only 40 per cent of the patients advised to secure glasses followed the advice, while 97 per cent secured the glasses after the necessity of this procedure had been clearly and forcefully explained to them. While this service did not materially affect the general public health, it did manifestly improve the welfare of the dispensary patient and rendered him potentially more capable in his daily activities.

Of the gynecological patients for whom operations had been advised only 7 per cent secured it, while under the new system 95 per cent were successfully persuaded to follow out the advice which they had received.

This illustration of the effectiveness of the follow-up system in connection with out-patient service represents a distinct advantage to the community. The dispensary

was able to give superior service and the results of dispensary treatment were correspondingly improved. The personal interest thus manifest in individual patients redounds to the credit of the dispensary and leads to a greater appreciation of its usefulness. The contrast between this modern social experiment and conditions previously existent suffices to convince one that the socialization of the dispensary is essential for the production of most satisfactory results.

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**Endemic Goitre.**—In the July editorial on Physical Betterment reference was made to the observation of Dr. Thelberg on the increase of goitre among freshmen at Vassar College. In the *Proceedings* of the Eighth Congress of the American School Hygiene Association, Dr. Hale, Professor of Physical Education and Hygiene at the University of Washington, calls attention to the problem of goitre as it exists in the mountainous regions of the Northwest. In his experience, half of the school children and adults show evidence of enlarged thyroid glands. From various sources, he produces testimony to support the contention that goitre is peculiarly a disease of the hills but has its origin in some exciting cause in the water supply. He attributes the increase of the disease to increasing organic impurity of the water and regards the toxic agent as inherent in the soil from which the water supply is drained.

On the theory that goitre is a toxemia whose origin is in the alimentary canal, he believes that steps should be taken to treat incipient goitre by the administration of intestinal antiseptics. If goitre is a water borne condition and the result of toxemia,

it is essential that prophylactic measures must attack the water supply. According to his experience chlorination of the water supply suffices to inhibit the toxic agent. Mountain streams are free from human pollution and possess but a small amount of organic matter; hence the water from such sources lends itself to chemical treatment very easily.

Though no contagium has been isolated, it is believed that possibly some organism exists, which, lodging in the alimentary canal, multiplies and induces a low grade toxemia, a part of whose effect is spent on the thyroid gland.

While this theory of origin still requires further proof, the fact that 19.5 per cent of the boys examined were affected and 33.19 per cent of the girls examined presented large thyroids indicates that the subject possesses more than academic interest. While it is not justifiable to parallel this condition with the hook-worm disease of the South, owing to the different effects which are produced, nevertheless, it is a subject deserving investigation by clinicians and physiologists, as well as by educators.

The services of the thyroid gland are sufficiently important in human activity to require normal function of the gland. Its internal secretion is an essential in maintaining normal metabolism and in preserving mentality and the nervous mechanisms at the highest point of effectiveness. Disorders of nutrition, cretinism, exophthalmic goitre, and apparent toxemias are induced in varying degrees dependent upon the amount, nature, and constituents of its internal secretion. A normal function of the thyroid gland is a necessary condition for the normal growth and function of practically all the organs and tissues in the body.

The presence of such a large proportion of goitrous individuals in a community should suffice to awaken the interest of the clinician, the physiological chemist, the pathologist, and the sanitarian. The goitre of adolescence is not understood any more thoroughly than is exophthalmic goitre. Each of them possesses important relations to the welfare and usefulness of those who knowingly or unknowingly are bearing these manifestations of a disordered thyroid secretion.

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**Institutional Dietetics.**—The importance of preventing diseases of metabolism or obviating the development of malnutrition in institutions, constitutes a serious problem to state, city, or county officers responsible for the welfare of inmates of institutions. Among the large expenditures, none is freighted with greater significance than the expenditure for food. Food economies cannot be estimated merely in terms of money expended but in connection therewith there must be considered the more important question of food value, food sanitation, and food variety.

In the Annual Report of the Department of Public Charities of the City of New York for 1914 there is evidence of an awakened interest in the nutrition of inmates in the departments under its charge. A more careful system of food inspection was installed, the dietary was revised, and a definite per capita allowance of each article of food was established for patients and workers. The distribution of food in accordance with the established ratios was made monthly so that where an increased institutional census developed, a corresponding increase in the food supply was provided.

**To prevent monotony in the daily diet,** the dietaries were made out for a two weeks' period instead of on the usual weekly basis. Stews were relegated to one day in two weeks and roast and boiled meats were substituted on other days where previously stewed meat had been given.

Similarly, definite necessary types of foods were given in larger per capita quantities. Cocoa was provided for every breakfast. The tuberculous patients received 1½ pounds of meat per diem instead of a half pound. The unpalatable fish chowder was superseded by pork and beans and creamed macaroni. The butter allowance was raised from ½ ounce to 1 ounce daily. The daily milk supply was increased for children from 25 ounces to 32 ounces and for tuberculous patients from 32 ounces to 38 ounces. Milk and sugar were provided for all cereals. A large variety of vegetables was introduced and potatoes no longer served as the single vegetable presented at some of the institutions.

This extensive alteration in the dietary of the institutions under the supervision of the Department of Public Charities appears more remarkable in view of the fact that it was accomplished at a decreased expense per capita than during the year 1913. The census of those to be fed increased 13.7 per cent in 1914 over 1913, while the increase in cost was raised by only 5.78 per cent. In view of the fact that the census increased by 13.7 per cent, it is noteworthy that the amount of milk and cream furnished increased 16.44 per cent, the supply of poultry 29.65 per cent, butter and eggs 15.04 per cent, vegetables 18.04 per cent, fish 22.22 per cent, dried fruits 21.33 per cent.

These marked benefits in increased dietary were secured through careful attention

to methods of purchase, selection of cuts of beef and choice of materials, while waste was eliminated in numerous ways. As an illustration of waste, it is noteworthy that the supply of flour and yeast decreased 2.06 per cent in quantity and 4.28 per cent in cost through controlling bread waste. There was sufficient elimination of waste to feed about 2,000 persons daily. While the feeding census was larger by 13.7 per cent, as has been stated, the total increased quantity of food was 8.88 per cent, while the total per cent increase in cost was only 5.78 per cent.

This attention to institutional dietetics is more significant because of the benefits which accrue to the inmates of the institutions through the increased per capita amount of food supply than because of the fact that an annual saving of little less than \$130,000 was effected in spite of the increased number of patients and workers. Hospitals and other medical institutions in general might well take cognizance of this dietetic experiment with a view to effecting financial economies while raising their dietetic standards. This is a type of constructive work which should appeal to physicians who are interested today more than ever before in establishing the highest degree of nutrition in institutions, in order to prevent the development of various diseases due to inadequate dietaries, as for example, pellagra, beriberi, scurvy, and similar deficiency diseases.

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**Trusteeship.**—The numerous problems centering about the physical care of dependent children are of primary importance in institutions. In the last analysis the trustees, who are responsible for the or-

ganization, direction, supervision, and control of child caring institutions, should be held responsible for the failure of their institutions to provide proper rules and regulations for the admission and discharge of children and for unsatisfactory results in the conservation of the health, morals, and education of the children under their care. The job of being a trustee is frequently taken too lightly. In recognition of the importance and usefulness of this public service, the Department of Child-Helping of the Russell Sage Foundation has issued a series of monographs based upon a round table plan dealing with vital problems of institutional management.

Inasmuch as the round tables cover a large variety of themes including trusteeship, income, costs, inspections, admission and discharge of children, physical welfare of children, academic and vocational education, religion, morals, and art, the institution staff, the plant and records, they represent a well rounded plan for self-examination and a splendid basis for self-correction.

Those familiar with the difficulties incident to institutional management may appreciate the importance of the training of trustees. This obtains equally forcefully for the administrative powers regulating the welfare of hospitals, dispensaries, convalescent homes, special institutions for the deaf, the blind, and the crippled, sanatoria, and various other institutions, the basis of whose work is generally deemed to be medical. The principles of institutional management may possibly require some modification in practice but fundamentally they are the same for all types of institutions. Even the question of education, religion, art, and morals need not be divorced from institutions caring for dependant adults.

The recognition of the influence of joy upon the welfare and health of individuals should call forth greater activities along recreational lines for the institutional adult.

The assistance thus provided for self-interrogation is not designed to create an omniscient board of trustees, but at least should suffice to awaken them to the importance of their functions and stimulate them to determining the most serviceable and practical methods of accomplishing the purposes for which their institution is established.

**Stamp Licking.**—The common habit of licking postage stamps has frequently given rise to a question as to the danger of infection from such a procedure. There is a great degree of reassurance in the fact that with the widespread practice there have been practically no reported instances of infection from this course. Keilty and McMaster (*Medical Record*, July 22, 1916) report laboratory studies on the normal bacterial flora of postage stamps with a view to determining their nature and the possibilities of the existence of pathogenic organisms. While practically all of the stamps gave rise to bacterial cultures, pathogenic organisms were not determined save possibly in two instances when the *micrococcus aureus* was obtained. The pathogenicity of these was not tested. Hence, it is safe to say that their results did not reveal the presence of any bacteria hazardous to human beings.

The work proves the stamp to be a carrier of organisms but this statement is equally true for practically everything which exists. The handling of stamps by several persons makes reasonable the possibility of the transfer of organisms from one individual to another. Laying aside the question of potential bacterial infection

due to stamp licking, it is rational to establish hygienic reasons for discontinuing this practice, not to mention esthetic considerations.

Under most favorable conditions it is not beyond the bounds of imagination to conceive of the conveyance of pathogenic types such as those causing diphtheria and tuberculosis. The mere presence of micro-organisms is not alarming. Living in the midst of rich bacterial flora, individuals are constantly exposed to far more important sources of contagion than stamps. On the other hand, stamp licking possesses no advantage, save possibly the slight food value which may exist for one whose duties require him to place thousands of stamps upon envelopes. Such circumstances, however, are most apt to occur when moistening devices are employed. Wherefore, stamp licking might well be relegated into retirement. The occasional stamp licker need not be disturbed. His chance of infection from this source is less than that resulting from breathing sixteen times a minute.

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**Popularizing Public Hygiene.**—Publicity measures have achieved a prominent place in the programs of health departments. Mere legislation does not suffice to secure sanitary conditions. Public enlightenment coupled with persuasion enables order to be produced out of chaos when all other measures fail. It is not to be expected that universal knowledge is to be attained readily. The constant presentation of facts to the populace is sooner or later to be attended with moderate success.

The bulletins of the various departments of health of states and large municipalities are at present filled with valuable information regarding flies, mosquitoes, care of babies, protection of water supply, the importance of adequate sewage and drainage, garbage disposal at vacation resorts; the

value of pasteurization of milk and its home care; the prevention of typhoid fever and similar sanitary measures which are essential during the heated season.

The mere publication of bulletins of this character, however, does not insure their being read by those most needing the knowledge they seek to impart. The mailing lists in general include those who are particularly interested in public health and do not as a rule include those who are indifferent or totally ignorant of the extent to which personal hygiene is involved in public welfare. A step in the right direction is indicated by a booklet issued in Kansas City under the supervision of its recent Director of Public Health, the late Dr. Paul Paquin. Simply written, crudely but effectively illustrated, it presents an excellent array of facts concerning matters of municipal health. The booklet was distributed by boy scouts to 80,000 homes. This represents an effective distribution of the message and should serve to awaken Kansas City to its duties and responsibilities in the protection of the health of individuals, in the abatement of nuisances, in the reduction of epidemics of contagious diseases, and in the physical care during childhood and adolescence.

Every city possesses a large number of agencies reaching into the homes and willing to cooperate in raising the standards of home hygiene and in protecting the health of the citizens. Such willingness to cooperate should not be cast aside nor inadvertently neglected as a medium of conveying reports, bulletins, circulars, and similar educational documents directly from health departments to the homes. This is a most effective way of combatting ignorance and securing some degree of assistance from those persons whose cooperation must be sought and secured. Vital messages of this character cannot fail to interest citi-

zens of all classes and to awaken within them a deeper appreciation of municipal and state departments of health.

The appeal to the people, through their minds and emotions, is sooner or later bound to result in greater willingness to extend appropriations for the protection of the public health. The cost of printing and distribution of hygienic advice is a negligible amount when compared with the costs incident to caring for the sick. The more money spent on education, the less necessity there will be for increasingly great expenditures on the therapeutic phases of health work. Expenses for public education may in a sense be regarded as public premiums for insurance on public health.

#### A New Theory of the Pathogenesis of Rickets.

Rickets.—Rickets is now regarded by many as a deficiency disease and Funk has expressed the opinion that it is due to an absence or a lack of the vitamines. In our recent Acidosis number (June, 1916) Dr. Eric Pritchard of London, Eng., suggested, however, that the condition was due not to any deficiency in the dietary, but to an excess of food, and in a paper read recently before the Royal Society of Medicine, London, his views as to the causation of rickets were set forth in detail. In his opinion the symptoms usually ascribed to rickets may be regarded as representing the results of calling into play in the economy of the victims of the disease, certain protective substances. The particular troubles from which they protect the bodily organism, in the case of rickets, are those which arise in connection with the disposal in the body of an excess of nutritive material.

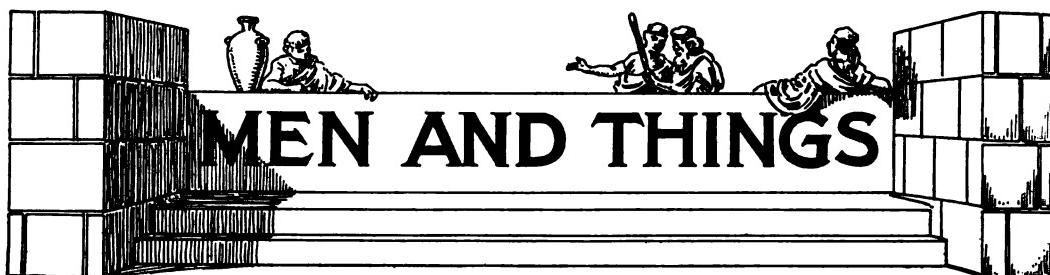
Pritchard points out the alternative methods by which any excess of food can be disposed of. The one to which he chiefly draws attention depends on the short-circuiting of the oxidation processes, and the production of various incompletely burnt-up products

of combustion. This method floods the blood with acid bodies of large molecular size and is commonly known as "acidosis." By excess of food, Pritchard does not mean "excess" in the popular interpretation of the term, but a relative excess, that is, an amount over and above that which is needed for the physiological requirements of the organism.

He emphasizes the fact that the food demands of many infants and children are negligible. If they are kept in hot stuffy rooms, if they are wrapped up in a multiplicity of clothes, if they are seldom taken out of doors, and if they are given no opportunities for muscular exercise, they will create no demand for food, and consequently any dietary, however small, may be relatively nutritive and if excessive must be disposed of by one or the other of the so-called protective methods.

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that for many years he has treated all cases of rickets on the assumption that the true pathogenesis of the condition is an excess of food producing an "acidosis." There is an old and rather homely English saying that the "proof of the pudding is in the eating." This may be applied to Pritchard's views with particular aptness, for basing his line of treatment on the assumption that rickets is caused by an excess of the food ingested, he has had results of the most gratifying and convincing character. At any rate, this line of thought is worthy of pursuing much further, and it may be that the exciting cause of several other conditions will be found in the chemical substances that develop or accumulate in the body following the ingestion of unnecessary and excessive amounts of food material. The proposition is so simple and commonplace, that one cannot but wonder that the whole question has not been taken up and studied in a common sense, practical way long before this. How prone we are to neglect the wealth of nearby truths and spend our time in seeking things beyond our reach!



**A Loss to the World.**—When the news was flashed over the country that Dr. John B. Murphy of Chicago was dead, there were few who did not instantly recognize the great loss surgical science had suffered. Probably there is no practitioner of surgery in recent years who has been more widely and universally known, or who has been more closely identified with modern surgical progress than has Dr. Murphy. Doubtless his connection with several famous cases, but more particularly that of Colonel Roosevelt at the time of his attempted assassination a few years ago, was more or less responsible for his name becoming so well-known to the people at large. But unquestionably the main reason for the widespread knowledge of the fact that he was one of the world's great surgeons can be traced to the notable contributions he had made to the technique of surgery. It is wrong to speak of these contributions as spectacular or sensational; they have been too useful and successful from practical standpoints to warrant any such description. But mechanical genius always attracts attention—particularly if the products of that genius mark an innovation, and in common parlance, will "work." Dr. Murphy was surely a mechanical genius. Not alone in the sense that he was possessed of mechanical skill and manual dexterity. These he had, to be sure, in large measure. But he had a great deal more, a sort of mechanical instinct that enabled him to recognize with accuracy the particular mechanical principle involved in each surgical problem before him; from this it was but a step to the practical application of these mechanical principles to the solution of the problem in hand. There was nothing complex or complicated in the technique evolved, nor in the devices or apparatus called into being to enable him to accomplish the purpose in view. Indeed sim-

plicity was the most striking feature not only of the physical or mechanical adjuncts to his technique, but of the technique itself. It was this beautiful simplicity, however that made Dr. Murphy the great operator he was, for it greatly shortened his operations, and enabled him to accomplish with comparative ease that which would appear extremely difficult to other surgeons.

So one who knew Dr. Murphy could go on indefinitely telling of his ability, his skill, his sound common sense and the countless other qualities that made him the master craftsman he was. Surgery has lost one of its brightest lights by his death, and it will be many a day before we see his like again, if ever. As the heading of this article indicates, the loss is not limited to the profession he had done so much to advance. The whole civilized world will suffer, for his labors at the time of his death held much that was rich with promise for the lightening of humanity's burden of pain and suffering. Deeply as we regret his death and sorrowful as we are at the grievous loss all humanity has thus sustained, we are nevertheless reminded of the following beautiful lines which are to be found in a sonnet to Charles Sumner by the immortal Longfellow:

Were a star quenched on high,  
For ages would its light  
Still travelling downward from the sky,  
Shine on our mortal sight

So when a great man dies,  
For years beyond our ken,  
The light he leaves behind him lies  
Upon the paths of men.

Could a more appropriate sentiment be expressed concerning one whose many works—the "button," the "drip," and the "Clinics" in particular—mean so much to mankind?

DR. JOHN B. MURPHY.

Dr. Murphy in addition to being a great surgeon was without a doubt one of America's greatest clinical teachers, and his apt powers of expression, his enthusiasm, and his splendid mental equipment, which enabled him to make the most of his wonderful experience and wealth of practical information, made his clinical lectures much sought by visiting physicians. His "*Surgical Clinics*," which have marked such a welcome innovation in periodical medical literature, will be missed by many who had come to depend on their regular visits; and those with a bent for surgery who were wont to "run up to Chicago" for a few days study-vacation will find a void at "Mercy" that time will not soon fill.

We have often referred to the legacies of other than material wealth that great men leave to posterity. Few there have been in recent years who with the ending of their labors have left more to their fellow men than Dr. John B. Murphy of Chicago.

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The epidemic of poliomyelitis from which New York City and its environs have been suffering since early in June seems to be on the wane, if a daily average of one hundred reported cases and over twenty deaths can be so considered. On their face, the figures, showing a drop from the two hundred cases per day reported a week or so ago, might well be looked on as a decline indicating the gradual control of the situation. As a matter of fact, this is not the case, and the epidemic shows a decrease in the number of its victims because of the decreased number of susceptibles being exposed to infection. At the beginning of the epidemic there was a certain proportion of the public susceptible to the disease and more or less liable to contract it if exposed to its virus. Quite a few close students of poliomyelitis claim that it is not highly infectious, and insist that there must be a very definite susceptibility to the disease to insure its contraction. This is well borne out by several facts, especially the frequency with which only one or two children, of families of five or six, become infected. All this points to a certain limit in the total number of those in any community who are susceptible. The same condition obtains in New York City, the only difference being

the increase in the total due to the increased size of the city.

With the fact established, therefore, that there was a fairly definite number of susceptibles to the disease, it must be plain that this number will be constantly being decreased by those who contract it, those who go away from the city, and those who take greater precautions to avoid exposure to infection. After a certain length of time, therefore, even with wider spread of the infecting agent, there is bound to be a numerical decline in the number of cases that become infected, a sign of the control of the epidemic that is more apparent than real.

This then is the situation in New York City. The epidemic has subsided because there are fewer susceptibles to feed upon. The danger of infection has been reduced with the decrease in the number of acute cases and corresponding decrease in the sources of infectious material. Following this line of thought it will be apparent that the danger of contracting the disease will still further diminish. But since this has resulted from natural conditions—the practical burning out of the disease—and not to any special act on the part of those who have been fighting it, or the employment of any definite and clearly effective preventive measure, it must be evident that the unknown factors in the transmission of the disease still remain and constitute a constant menace to every susceptible coming back into the city.

No reflection is intended in anything we have said, either on the local or federal officials. We have every reason to believe they have done the best they could under conditions which have been most trying and difficult. If their efforts have been handicapped by politics, or circumstances entirely beyond their control, certainly they cannot be blamed for the paucity of the results accomplished. If they have been denied the unlimited power and resources they should have had, again they cannot be blamed if the epidemic has gone on unchecked. The men who have been conducting the campaign to master the situation are trained and experienced scientists of unquestionable ability and integrity. The failure to control the disease, therefore, cannot be laid at their door.

**But something is wrong somewhere.** We do not feel free, however, to point out specific reasons for complaint and criticism, for there is too great danger of reflecting, even though unintentionally, on those whom we are confident have done their level best. Politics or political influences have undoubtedly played an active part in handicapping capable, willing and faithful officials. If this is so, and there are abundant reasons for such a conclusion, once again is shown the necessity of removing our health departments from the influence of politics. Then, conscientious officials will be able to establish effective quarantine and enforce it as it should be, without the slightest fear of interference from the political organizations or local bosses. This detail of the struggle to control the present epidemic has been woefully lacking in every respect. Not only has it been tardily established on repeated occasions but when established it has in too many instances meant little or nothing to those quarantined. It can hardly be doubted therefore, that one of the chief factors in the failure to control the present epidemic has been the inability of the officials in charge to establish and maintain as rigid and effective quarantine as they would had circumstances permitted.

So also in respect to the hospitals. Much might be written on the errors of omission and commission that the hospitals have been guilty of in connection with the handling of poliomyelitis cases. It will serve no good purpose, however, to recite specific instances of neglect, carelessness and actual venality. Suffice it to say that to the onlooker it would seem that the city and federal officials fighting the present epidemic have not had the active aid and cooperation from the hospitals—with a few notable exceptions—they would have had, had these institutions been under the immediate management and absolute control of the Department of Health. Some day this will be the case, but until it is, our local health officials are going to be handicapped just as they have been in this conflict with poliomyelitis. Here again one may wonder how much more might have been accomplished had it been possible to command all the resources of the local hospitals and marshal them solidly with their equipment on "the firing line" against poliomyelitis. Reference might be made to other obstacles that have sadly in-

terfered with the work of those who have been charged with the direction of the current fight against poliomyelitis, but lack of space prevents. To those who are inclined to criticise and condemn the physicians who have led the health forces in the conflict we would respectfully suggest a careful consideration of the whole situation. We are not seeking to defend the officials who have conducted the struggle to control and overcome the present epidemic. They need no defence by us or by any one else. But what we do seek is to point out that a health campaign can be effective and successful only to the extent that it is free, untrammeled and all powerful in the field of its activities. If thus free and unrestricted the results will invariably reflect the efforts expended. If on the other hand, the work of those delegated to fight any scourge are hampered and limited by political or other conditions, the results will also show it—just as they have in the current epidemic.

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**Anti-Diabetic Foods.**—Various food products have been placed on the market with verbose recommendations and misrepresentations by the manufacturers. In so far as foods possess therapeutic indications, as, for example, in the anti-diabetic commodities especially prepared for diabetics, misbranding and unfounded statements merit only condemnation. Some diabetic foods contain almost as high carbohydrate percentages as the ordinary products designed for the use of normal individuals. One diabetic biscuit widely advertised contains 64.42 per cent. carbohydrate while one of the gluten flours presents 64.10 per cent. of carbohydrates.

Obviously, the establishment of standards for diabetic foods should not be based merely upon the protein content. The Federal Food and Drugs Act merely prescribed that the food should contain at least 35 per cent. of protein. The basis of utilization of a gluten flour is not because of its richness in protein, however, but by reason of the decrease of carbohydrates which it is presumed to contain.

In order to establish more adequate standards the United States Department of Agriculture has recently confirmed a new basis for the chemical constituents of diabetic

foodstuffs. Gluten flour is to contain not less than 7.1 per cent. of nitrogen, nor more than 56 per cent. of nitrogen-free extract, while not more than 44 per cent. of starch, as determined by the diastase method, is to be present. A diabetic food is to contain not more than half as much of glycogenic carbohydrates as the normal food of the same class.

It is to be hoped that the proper labeling of diabetic foods will soon conform with the new standards and thus protect both the physician who advocates their use and the patient whose condition demands reduced carbohydrates for the preservation of life.

**The frequency of endamebiasis** is being appreciated more and more as reports are coming in from a number of investigators. It seems that the particular variety of ameba which inhabits the mouth, the *endameba gingivalis*, may be expected to be found in almost every case of illness (and consequent lowered resistance) no matter what the cause; and to be a more or less active factor in a large proportion of these.

As a result of the examination of some 400 charity hospital patients suffering from a wide range of ailments, Lynch (*Am. Jour. Trop. Dis. & Preventive Med.*, Oct. 1915) found endamebiasis in some stage in no less than 98% of all these subjects. More recently Evans, Middleton and Smith (*Am. Jour. Med. Sci.*, Feb. 1916) examined the mouth and tonsils of 362 goiterous individuals and in 22% there was a tonsillar endamebiasis while there was a less marked but definite infection of the mouth in 90% of the individuals so examined.

It is of much practical interest to note that as a result of this endamebic infection thyroid dyscrasias were present quite frequently, i. e. the glandular enlargement was accompanied by some evidences of disthyroidism, and out of 23 patients treated with emetine, there was a reduction in the thyroid in no less than 18 cases.

There is no doubt that the analysis of the complex and intractable chronic disorders which so often disconcert us must henceforward include an examination of the gums, mouth and tonsils for the endameba and when this shows us that they are present, the rational treatment— injections of

emetine—will cause many a change for the better in some intractable symptom which heretofore nothing had seemed to influence.

We believe that this remedy is destined to be used still more commonly than at present and that before long it will have attained a position in therapeutics level with the other time-tried "specifics."

**Testing the Nerves.**—An interesting phase of the technical study of nerve control is mentioned by the Paris correspondent of the *Lancet*. He describes an apparatus by means of which it is possible approximately to register the degree of self-control in beginners in airmanship.

The candidate is submitted to a violent and unexpected sensation, visual or tactile—a magnesium flash, a detonation, or a douche of ice-cold water. The apparatus registers "the tremor of his hand, the acceleration of his respiration, and the beating of his heart. A pilot should remain imperturbable not only morally but also physiologically."

**Poison Alarms.**—A poison bottle, intended to give warning when opened that it contains poison, has been invented by a New York doctor as his contribution to the effort to reduce the number of deaths caused by accidental taking of poisons, such as bichloride-of-mercury tablets. His poison bottle liberates a very noticeable odor every time it is opened. In the neck of the bottle, on the inside below the cork line, is a little niche, in which rests a sack containing the smell-making chemical.

Another application of the idea is the placing of such a sack in a niche on the bottom of the cork. When the cork is taken out of the bottle the sack sends its odor into the air, which serves as a warning. Any druggist can concoct the necessary smell, making it either disagreeably nasty or simply just penetrating; and no one would be likely to swallow a supposed headache tablet coming from such a bottle.

These efforts to reduce the menace of the "poison bottle" deserve the hearty support of the profession, for accidental poisoning presents a serious and growing problem.



## SYDENHAM'S CHOREA TREATED BY MARINESCO'S METHOD.

BY

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In these latter years the attention of some experimenters and clinicians has been directed to a substance,—magnesium—of which analgesic and sedative properties are well known, but the use of which in the therapy of chorea has not as yet become general.

Meltzer and Auer have shown that the salts of magnesium in intravenous, subcutaneous and intraspinal infections or even in local applications to a nerve trunk, exercise a remarkable action on the functions of nerve tissue inasmuch as they suppress its two principal properties: excitability and conduction, which however are again readily restored to normal after irrigation with physiological salt solution. These authors had then the idea of applying these experimental results to human therapy and substituted intraspinal injections of magnesium sulphate to injections of cocaine, to obtain spinal anesthesia. The dose used was of .02 grs. of magnesium sulphate for every kilogram of body weight, i. e., 1 cc. of a 25 per cent. solution for 25 pounds of body weight. Three to four hours after the injection, they noticed a

paralysis extending from the pelvis to the lower extremities, and an analgesia such as to permit operations on these regions without causing the slightest pain. They also noted that sensibility and mobility reappeared from 14 to 18 hours after the injection, but often there was a retention of urine which required catheterization for one to two days. In one case, having by mistake given too large a dose, they observed that analgesia and paralysis came on more rapidly and two and one-half hours later the patient fell into a profound state of general anesthesia with notable reduction in the respiratory rate (10 per minute); a lumbar puncture, with the escape of some spinal fluid, and irrigation of the spinal canal with physiological salt solution, soon caused disappearance of the paralysis. In another similar case they noted a retention of urine which lasted for twelve days; they consider these phenomena as due to a fault in technique.

Following these experiments of Meltzer and Auer, and after considerable research on the sedative action of magnesium sulphate in the gastric crises and lightning pains of tabetics, Marinesco was the first to try intraspinal injections of magnesium sulphate in patients suffering from Sydenham's chorea, and reports four cases successfully treated by this method; but while he mentions the good results obtained, he

points out that the method is not free from inconveniences, often serious, such as dyspnea, anesthesia, paralysis, etc., which however, he attributes in part to impurity of the drug inasmuch as they occur much less frequently after the use of pure magnesium sulphate; the hypertonicity of the solution may be a factor also, its freezing point being much lower than that of the cerebrospinal fluid; it has recently been pointed out that affections of the central nervous system and organic lesions in general are also partly responsible.

Soon after the attempts of Marinesco, experiments were made with his method with good results. Baduel successfully treated a case of severe chorea, the choreic movements disappearing rapidly after the use of the drug. Soon afterwards, Rocaz tried the method in five children suffering from chorea, with remarkable results. Recently Bouchut and Devic reported a case of a woman 51 years old, suffering from recurring chorea and treated by the method in question after having received no benefit from the usual therapeutic measures. She was given a preliminary intraspinal injection of 33 cc. of a 25 per cent. solution of magnesium sulphate, which gave rise to restlessness, followed by a short period of diminution of the choreic movements and finally again restlessness, fever, retention of urine and a facial eruption. A second injection of 5 cc. was given on the fourth day, with complete disappearance of the involuntary movements. Nevertheless, the patient's general condition did not improve and on the eighth day a third injection of 5 cc. was given which was followed by profound stupor; the urine was bloody, pulse rapid; this condition persisted till death which occurred on the fourteenth day. Autopsy showed a

recent mitral lesion with a gelatinous plaque of the aorta; no macroscopic lesion of the nervous system. Evidently in this case the failure is not only to be attributed to the poor resistance of the patient, but also to the too intense character of the treatment.

In this connection, more convincing is the case of Caronia who recently tested the method in a lad of 10 suffering from severe chorea; the boy had great difficulty in walking or even standing. Following the injection of 8 cc. of a 25 per cent. solution of magnesium sulphate, the involuntary movements of the lower extremity disappeared within 15 minutes, and those of the upper extremity and of the face within 30 minutes; at the same time there developed a complete paralysis of all muscular groups, with abolition of sensibility, reflexes and consciousness, which symptoms however gradually disappeared in the course of the next few days and the patient made a complete recovery.

I will now briefly give the history of seven cases of Sydenham's chorea which I have treated by Marinesco's method; they were all cases which were not helped by other means. In the technique, I did a lumbar puncture between the 4th and 5th vertebrae with the patient in the lateral position in order to obtain a more rapid and complete diffusion of the drugs injected, immediately after the withdrawal of a quantity of spinal fluid varying according to the age and body weight of the patient. Marinesco advises 1 cc. of the solution for every 25 pounds of body weight, but as we were dealing with experiments in our cases, it was thought advisable to keep a little under; solutions of magnesium sulphate of various concentrations were used.

*Case 1.* V. D., 14 years old, school girl:

family and past history negative. Present illness began 7 years ago when it was noticed that she began to have involuntary, purposeless movements localized to the head, especially about the face and eyes. She did not improve under treatment and soon the movements spread to the limbs. At the hospital a diagnosis of chorea was made on inspection; patient ran an irregular temperature found to be due to fecal stasis; a cathartic brought temperature down to normal. On the 24th day she received an intraspinal injection of 2 cc. of a 7 per cent. magnesium sulphate solution. No changes were noticed until the 32nd day, when patient's movements began to diminish and continued to do so until she was allowed to go home completely cured, one week after the injection.

*Case 2.* I. I., 14 years old, school girl. Negative family and past history. Present illness dates from 5 years ago when after a fright, child began to have incoordinate movements of moderate intensity in the arms, soon spreading to the trunk and lower extremity; they gradually became more intense and have persisted to the present time in spite of treatment. On 9th day of her admission in the hospital, she received an intraspinal injection of 2½ cc. of a 7 per cent. solution of magnesium sulphate, which caused some headache. The next day the choreic movements had somewhat diminished and on the 18th day from admission the child was practically well except for an occasional incoordinate movement which persisted even after a second injection, and a subsequent arsenical treatment.

*Case 3.* L. L., 12 years old, school girl; negative family and past history. Twenty days ago, with no apparent cause, child began to have incoordinate movements of her left hand, gradually extending to the rest of the body. Was not improved by the usual treatment. On the 12th day of her admission to the hospital she was given an intraspinal injection of 3 cc. of a 7 per cent. solution of magnesium sulphate, which was soon followed by a slight elevation of temperature, and on next day by attacks of vomitings which persisted for two days and had to be controlled by morphia. The choreic movements had however greatly diminished and on the 16th day had disappeared; patient was discharged well a

few days later, after the administration of a few doses of Fowler's solution.

*Case 4.* L. V., 12 years old, school boy. Two weeks ago he began to have incoordinate movements of the lower extremities, soon spreading to the upper; the movements were quite intense and caused patient a great deal of trouble. At the hospital he was given an intraspinal injection of 2½ cc. of a 7 per cent. solution of magnesium sulphate, 10 days after admission; the next day the movements had somewhat diminished in intensity and improvement became more manifest during the following few days. He was kept under observation for a month during which time he did not develop any disturbances, and was then discharged perfectly well.

*Case 5.* M. O., 8 years old, school girl. Family and past history negative. Parents state that ten days ago child fell ill with general malaise, anorexia, irregular temperature, epistaxis and constipation. Physical examination revealed nothing but a meteoric abdomen. During the first few days in the hospital she ran a continuous remittent temperature, had headache, epistaxis and a dicrotic pulse. Widal was positive. On the 9th day she entered into convalescence which ran regularly for four days, after which the child began to have incoordinate movements, at first slight and transient in the lower extremities, later of greater intensity and rapidly spreading to the rest of the body. The peculiar character of the movements led to the diagnosis of chorea. As they did not tend to diminish in spite of treatment, on the 14th day of their appearance it was decided to try Marinesco's method. She was given 1.25 cc. of a 7 per cent. solution of magnesium sulphate intraspinally. Nothing was noticed till the next night when the child complained of local pain at the site of injection, which however disappeared within a few hours. No apparent improvement followed for several days at the end of which the choreic movements began to diminish in intensity; for the next few days the child was given a few doses of Fowler's solution, and after a relatively short time she left the hospital perfectly well.

*Case 6.* D. C., 12 years old, school boy. Family and past history negative. A few days ago patient was seized with chilliness,

fever, headache and pains in the bones, no cough. The fever disappeared rapidly and at the end of a week patient felt well, but soon developed strange, incoordinate movements for which he came to hospital. Diagnosis of chorea was made on inspection. As the patient's general condition was not very good, it was not thought advisable to use Marinesco's method and patient was treated by every other means but with no definite improvement; it was only after six months that he was able to return home, somewhat better, but not cured of his trouble. Five months afterwards he had an acute exacerbation of the process, especially in his right leg and arm, and again came to the hospital. His general condition being good, 2 cc. of a 10 per cent. solution of magnesium sulphate were given intraspinally. One-half hour afterwards, patient complained of pain in lumbar region gradually spreading upwards; soon he developed a temperature and headache, which however disappeared on the second day. No improvement whatever was noticed for a month at the end of which a second injection was given (2 cc. of a 10 per cent. solution). Headache and slight elevation of temperature occurred this time also, but disappeared in 24 hours. During the next few days the movements in the right lower extremity became of less intensity and finally disappeared; the movements of the right upper extremity went through a similar course and one month after the second injection the patient was discharged completely cured.

*Case 7.* C. G., 11 years old, school boy. Seven days ago his classmates noticed that he began to have incoordinate movements and at times dropped whatever he had in his hands; as these movements have progressively grown worse, he was taken to the hospital where a diagnosis of chorea was made. After a few days of his stay in the hospital, he was given an intraspinal injection of  $2\frac{1}{2}$  cc. of a 25 per cent. solution of magnesium sulphate. A few hours later patient developed a temperature of 100 degrees F. followed by severe headache; on the next day the temperature had disappeared, but no improvement was noticed; herpes labialis occurred on 3rd day. A second injection of the same dosage was given on 35th day, which again was fol-

lowed by a rise of temperature, 99.5 degrees F. and later by headache and vomiting. Notwithstanding this energetic treatment, only a slight improvement could be seen; a third injection was given twenty days after the second; this time there were no disturbances, patient's condition rapidly improved and soon he was discharged practically cured.

From the above results and those obtained by other authors, the following conclusions can be drawn:

1. Intraspinous injections of magnesium sulphate in the proportions and doses indicated by Marinesco, give good results in cases of chorea minor.

2. There is always an improvement in cases of chorea minor at times soon after the first injection, at others sometime afterwards. In some cases improvement is progressive up to complete recovery; in others a second or even third injection is necessary before any improvement can be noticed or a cure effected.

3. Recurrences are rare.

4. A short arsenical treatment is of value following the treatment in question.

5. The method of Marinesco is not to be used in all cases of chorea, as the percentage of cures or improvement is not greater than that obtained by the use of other drugs, but should be restricted to two classes of cases:

(a) Cases where other treatment has not given good results.

(b) Cases where the choreic movements are pronounced to the point of interfering with the patient's rest and therefore need immediate reduction.

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**Exophthalmic Goitre.**—Sinosersky (*Western Med. Times*), has obtained excellent results in certain cases of exophthalmic goitre by exposure of the thymus to the X-rays.

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**Do you know that** plague is a disease of rodents? Malaria is spread by a special mosquito? House screening is a good disease preventive? Fingers, flies and food spread typhoid fever says *Med. Summary*.

## CHRONIC PHARYNGITIS.<sup>1</sup>

BY

GEORGE A. ROBERTSON, M. D.,  
Louisville, Kentucky.

To the care of every physician come patients for treatment of pharyngitis. There are many varieties, but only the chronic form of pharyngeal inflammation, and certain symptoms which are misleading as diagnostic signs, will be considered.

In the beginning frequent attacks of rhinitis, and obstruction of the nasal passages by adenoid tissue, produce certain changes in normal function of the nose; gradually there is lessening of the secretions and the air passing through the nose dries or absorbs the moisture, thus leaving upon the mucous membrane of the turbinates a thin layer of drying mucus; over this surface respiration enters unfiltered or without being freed from dust and particles of infectious material, thus reaching the pharyngeal vault too dry, striking the wall at a point where in childhood the adenoid tissue exists moist and ready to attack the foreign material accompanying the respiratory breeze. As pharyngitis is preeminently an affection observed in adult life, the protection afforded by this adenoid tissue is no longer available, and the mucous membrane has to perform the vicarious duty of lending its secretions to moisten the air. To accomplish this an increase in the amount of mucus secreted becomes necessary, which as it dries spreads like a thin varnish over the pharyngeal surface. Another symptom which results, the sense of "dropping in the throat," depends upon the fact that the nasal mucosa has ciliated epithelium, while the pharynx has only squamous and

stratified epithelium; and by the action of its ciliated epithelium the nose forces the mucus backward into the pharyngeal space where it accumulates and hangs in festoons, and being literally a foreign substance the patient endeavors to expel it by "clearing the throat." Scraping and hawking tears away the drying mucus and with it the epithelial surface, causing trauma and producing lines of inflammation along the posterior wall of the throat.

One reason why pharyngitis is now so prevalent and persistent is the increasing demand upon the throat in using the voice. Business requires much talking in public places; one must speak above the noise of street cars and the traffic of city streets; the almost continual use of the telephone; the crowding of large numbers of people into halls and assembly rooms; and especially the hours spent in overheated and unventilated rooms all expose the nasal and pharyngeal spaces to exceedingly dry air, much dust and infection. The inflamed pharynx with its bands of thickened membrane, its areas of congestion, and the necessarily increased muscular effort to use the voice-producing machinery, all induce fatigue when one tries to talk.

There are a great variety of symptoms which direct the physician's attention to the pharynx. A few illustrative examples may be permissible.

*Case I.*—A. B., a female, had always enjoyed good health. Following a "cold" she developed a cough which persisted for six weeks, growing more and more troublesome; it was oftentimes so severe that nausea resulted. There were no other symptoms, and while no pulmonary lesions could be demonstrated, a fear of tuberculosis caused the patient and those about her to be anxious.

After trying several remedies for the cough (which was diagnosed as "bronchial") without appreciable result, the post-

<sup>1</sup> Read before the Society of Physicians and Surgeons, Louisville, Kentucky.

nasal space and pharynx were treated with the time-honored nitrate of silver, and the patient given a spray for the nose. The diagnosis of pharyngitis was made. The cough entirely disappeared.

*Case II.*—B. C., a female of fifty, a great sufferer from headache; kept herself supplied with "Hamburg tea" and other remedies for supposed "biliousness" and headaches presumably due to auto-intoxication.

The post-nasal mirror showed a dull red, shining area in the upper pharyngeal space with dry and thickened mucous membrane. Local treatment relieved both the pharyngitis and the headache.

*Case III.*—C. D., a male, whose business required much talking; was greatly disturbed by the constant need to "clear his throat," it being necessary to cough before beginning any conversation. This was not only exceedingly disagreeable but also at times painful, and in many instances symptoms of laryngitis, hoarseness and loss of voice were noted.

In this case examination disclosed the presence of chronic rhinitis, a red dry pharynx with dilated blood vessels along the posterior wall—the condition known as pharyngitis lateralis—where there are thickened folds of mucous membrane along the sides of the throat just behind the posterior faucial arch. Local treatment to this pharyngeal area caused immediate improvement, and all symptoms slowly subsided.

Headache, pain in back of the neck, so-called "rheumatism of the throat," hoarseness, cough, are all symptoms of pharyngitis. There are three points where the patient usually refers the discomfort or pain incident to chronic pharyngitis; (1) fulness and irritation at the laryngeal opening or glottis; (2) pain and aching at back of the neck; (3) pain on top of the head over an area not larger than a silver dollar. The most serious complication of pharyngeal inflammation is chronic middle ear deafness. Inflammation of the mucosa may extend along the Eustachian tube; it may cause serious changes in the middle ear; bands of adhesions may form across the fossa of Rosen-

muller and draw the opening of the Eustachian tube into a narrow slit. The free passage of air into the middle ear is thus lessened, the air pressure is changed, the chain of ossicles becomes fixed, the tympanic membrane retracted, and the beginning of middle ear trouble instituted. Then, when our usefulness should be greatest, the signs of deafness appear, and our associations and activities begin to decrease because this special sense is dulled.

The anatomical conformation of the pharynx will assist in determining what complication is likely to follow repeated attacks of pharyngitis. The large round throat is apt to be dry because the space is open, and the chief symptom is cough or "clearing the throat." The flat or wide throat with little depth between the soft palate and the pharyngeal wall is the one in which the ear symptoms may be expected, because the fossa of Rosenmuller is narrow and a small amount of thickening or inflammatory change will prevent free ear ventilation.

This subject was chosen because the general practitioner treats many cases of pharyngitis, usually by prescribing a gargle in the hope of relieving the most urgent symptoms. If he does not do more, and warn the patient of the chronicity of the affection and the dangers of complicating deafness, he has omitted the most important part of the management and treatment.

How shall patients be treated for chronic pharyngitis? A gargle will not reach the pharynx, because first the fauces close and keep the fluid away from the pharyngeal wall, and second the inflamed area is above the level of the most open part of the throat. The patient should be made to understand that the only way to reach the inflamed spot is by a spray through the nose.

The spray should be given as a routine measure, using bland oil such as liquid petrolatum or albolene, incorporating therewith menthol and eucalyptol in one per cent strength. This should be frequently employed and in sufficient quantity to reach the post-nasal area. If much mucus is present irrigate with an alkaline solution, but the use of large quantities of water in sprays, and douches, should be avoided. If there are areas of redness with great thickening of the mucosa, they may be touched with nitrate of silver one to two per cent, or one percent iodine in glycerine. It must be remembered that in chronic affections the tissues are below normal, and strong remedies should be avoided. We are prone to overtreat chronic ailments. As far as may be possible seek the cause among the habits of the patient. Avoid violent scraping to remove the dried mucus. Correct the manner in which the patient lives, eats, sleeps, the surroundings. The intestinal tract and kidneys must be interrogated and any irregularities or abnormalities corrected; the elimination brought to standard; the general health made as nearly normal as possible. Train the patient not to expect relief from pharyngitis until he is willing to vary his habits and manner of living. Also warn him that the trouble may be due to many years of disregard, probably dating from childhood and the "bad colds" of that period. And finally put your trust for relief upon the post-nasal space, the upper areas of which may be best and most easily reached through the nose.

It is always surprising to the patient that his sore throat may be relieved by having his nose treated, and when a laryngeal irritation disappears after use of the nasal spray he is astonished.

Dr. I. Lederman:

The subject selected by Dr. Robertson is

one with which we are all familiar. There are one or two points which I would like to emphasize.

In most instances chronic pharyngitis is not primarily due to disease of the pharynx; it follows nasal disease, such as hypertrophic rhinitis, atrophic rhinitis, etc., either by extension or because of interference with nasal respiration. In other cases it may be due to mouth breathing and consequent irritation of the pharyngeal mucosa by the unprepared air thus inspired. Air entering through the nose is supposed to be prepared by the addition of moisture and heat for reception into the pharynx.

While pharyngitis most frequently follows affections of the nose, it may also be dependent upon some general disease. Chronic pharyngitis which does not respond to local treatment is usually due to some form of systemic dyscrasia, such as lithemia, rheumatism, or faulty metabolism from some other cause. Constipation is probably one of the most frequent general causative factors. The excessive use of tobacco must also be considered. I have always believed that primary irritation of the pharynx does not occur from the moderate use of tobacco; but if there exists an hypersensitiveness of the pharynx, the constant use of tobacco will undoubtedly superinduce a chronic pharyngitis. Alcohol may have the same effect. The eating of highly seasoned foods, the use of inordinately hot drinks, etc., in fact anything which may tend to irritate the mucosa may act as a cause.

With reference to the complications: The doctor spoke of middle ear disease. He might also have mentioned that a great many cases of chronic laryngitis have their inception in pharyngitis, either by direct extension of the process, or from the same cause which originally produced the pharyngitis.

As to the prognosis: There are few patients who cannot be temporarily relieved by simple methods of treatment, but when it comes to the actual cure of chronic pharyngitis many considerations confront us. To locate and remove the exciting or contributing cause is not always easily accomplished.

Concerning the treatment: There are no specifics nor new methods of treating chronic pharyngitis so far as I am aware. The nose should be carefully examined and any malformation or abnormality corrected, be it hypertrophied turbinates, deflected septum, disease of the accessory sinus, or what not. Dr. Robertson is correct in saying that treatment must be instituted through the nose.

One point I desire to particularly mention is the occurrence of pharyngitis in children. In the child there are many more glands on the posterior pharyngeal wall than in the adult, and Waldeyer's ring is also much more pronounced. Atrophic pharyngitis is a more common affection in children, while hypertrophy of the glands of the posterior pharyngeal wall frequently occurs in children in whom tonsils have been removed. Both these affections cause similar symptoms in childhood as chronic pharyngitis in the adult, and usually require the same degree of attention. They are among the unimportant naso-pharyngeal affections, yet are of sufficient consequence to require treatment.

I wish to again emphasize the fact that chronic pharyngitis is seldom a disease *per se*; that it is usually caused by some other affection, most often of the nose or nasopharynx; also to reiterate the importance of correcting the habits and hygienic surroundings of the patient, and treating any general dyscrasia that may be present.

## A REPROACH TO OUR PROFESSION.

BY

HOWARD CRUTCHER, M. D.,  
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In the April issue of AMERICAN MEDICINE will be found the following editorial observation:

"Probably the greatest blot upon the efficiency of scientific medicine is to be found in our handling of venereal diseases."

I endorse this sentiment whole-heartedly and adopt it as the text of my remarks.

It may be stated at the outset that there can be no possible compromise between science and whatever may interfere with its progress and full development. Speaking from the standpoint of a man of science, one disease or injury is precisely as respectable as any other. The jejunum and the gall-bladder may not rank in the social scale with the brain and the triangles of the neck, but at the sacred altar of scientific medicine the last shall at least be equal to the first. During my student days I was taught at every turn of the road that all venereal diseases were to be loathed by real men of science, and I recall with what supercilious contempt my medical preceptor and my spiritual adviser joined hands and hearts in casting withering glances of lordly contempt upon any medical man who would befoul his hands with any disease venereal in character. Those were the glorious days in which we applied slippery elm poultices to the skin of the lower abdominal region for a gangrenous appendix and treated fractures of the skull with opium and ice water.

Let it not be inferred from this that I was ushered into life in some backwoods settlement. Not by any means. I was born in the world-famed capital city of the Blue Grass Region, the home of Benjamin

Dudley, and lived for years within a stone's throw of the grave of Ephraim McDowell. My venerated preceptor (peace to his ashes!) was a pupil of the great Samuel David Gross and was intensely fond of amputations and lithotomies. A man of sixty-five years was taken to a distant city, where he underwent an operation resulting in the restoration of his eyesight. By many the outcome was declared to be a miracle. My recollection is that the operator received seven hundred dollars for the ophthalmic work and the whole region thereabout resounded with praises for his skill. A well-known banker made a journey shortly afterward and it was whispered about the streets that he had also undergone an operation. His condition was always referred to in undertones and I may perhaps be forgiven for having inferred that he was the victim of venereal infection. It developed afterwards that he had been cured of hemorrhoids by no less distinguished a surgeon than Dr. Phineas S. Conner of Cincinnati. It may be observed in passing that whilst the victim of cataract received the fervent prayers of the faithful, the hemorrhoids of our honored banker were never one time mentioned in any supplication to the throne of Grace. And yet I was taught by my father to believe that the fall of a sparrow was an event of as much importance as the collapse of the Coliseum at Rome.

In 1896 I was the guest of my honored old master in surgery, Phineas S. Conner, and was privileged to have several long and intimate talks with the great surgeon concerning perplexing problems in pathology and kindred subjects. One morning I saw him perform a most difficult operation for the relief of a deep perineal stricture. On leaving the hospital I managed to draw from him his opinions on several mat-

ters, amongst them his views upon the proper management of urethral stricture. I shall again quote his words precisely as I remember them:

"The medical profession is guilty of gross stupidity in handling diseases of the urethra. Gonorrhea kills ten times as many men as syphilis, not immediately but remotely. You younger men must not be ashamed to correct the mistakes of your predecessors in this matter. Syphilis and gonorrhea have been regarded as back-alley complaints to be turned over to the tender mercies of the worst brood of quacks on the face of the earth. It is time for a radical reformation. You boys thought I was joking when I used to tell you that the urethra is as delicate as the human eye. Many a man can perform a creditable amputation, but it takes a surgeon of the very highest skill to pass a catheter and do it right. It is, of course, easy when there is nothing the matter, but who calls us when there is nothing wrong?"

It is unnecessary to say that the words of my revered old teacher made a deep and unfading impression upon my mind. It was then, eleven years after my graduation in medicine, that I began the study of the anatomy of the genito-urinary tract! You need not be reminded that I had a great deal to learn.

Nor let it be supposed that contempt of those who treated venereal diseases was confined to rural settlements in Kentucky and Indiana. In 1886 I heard Nicholas Senn speak with a measure of contempt of a man who was known to devote especial attention to diseases of the genital tract. Some time about 1892 when a special and admiring pupil of G. Frank Lydston, one of the most scientific men in America, I heard him make this caustic remark:

"Yes, I know that this sort of work is sneered at by men who can not describe the gross anatomy of the bladder!"

It is the duty of the medical profession to accept the teachings of science in all its purity and to follow those paths which alone can bring results worth the having. We must follow the sound teachings of rational pathology through whatever tissues they may lead and apply the same approved methods of treatment to every part of the human frame, without fear or favor.

It may be set down as fundamental that it is no part of the duty of a scientific practitioner of medicine to give a social rating to the various pathological problems that come to him daily for proper solution. It is his duty to bring to bear upon every case under his charge the unvarying rules of revealed science, and here his obligation ends. One of my patients while sojourning in Mexico many years ago contracted both smallpox and gonorrhea from the same person at the same contact. He received boundless sympathy on account of his pock marks, but when I found it necessary to perform a medium perineal section some time later for the relief of a dense stricture a revelation of his true condition disrupted several family ties and shook the social fabric of a certain community from center to circumference. Curiously enough, one venerable cornerstone of society assured me that he deeply deplored "those blasted pock marks" whilst he supposed that "the contraction of gonorrhea was something to be expected, especially in Mexico."

The medical profession not only loses a perfectly legitimate income from its neglect of venereal conditions, but it does worse: it brings a deep reproach upon every reputable member of the profession from the general contempt in which the so-called

venereal "specialists" are held by laymen as well as honorable physicians. I have met with many of these miserable parasites who rejoice in the title of "private disease" specialists. Fortunate, indeed, that they do not as a general rule attempt their practices upon the diseases of the public. To refer to these shameless bunglers as "cheap" charlatans would be to magnify all other forms of meanness and inferiority. I once knew one of these imposters whose anatomical training was so deficient that he actually called in a notorious criminal "operator" in a public bathing establishment to administer an intravenous injection of an antisyphilitic compound. In personal conversation with him I soon learned that he did not know even the outlines of urethral anatomy. To cap the climax, he assured me that prostatic hypertrophy obstructed the urinary flow by "pushing against the walls of the urethra."

Many times have I been called in by the victims of untrained pretenders to relieve some critical condition of the deep urethra. Just now I recall a case in which a sound had been forced into the perineum with such reckless disregard of human life that urinary extravasation had almost invaded the entire cellular areas of both thighs. In a considerable number of cases I have been compelled to perform the supra-pubic operation, followed by retrograde catheterization, before being able to identify the canal in the perineum. I hope none will ever be restrained through false pride,—perhaps vanity is a better word,—from performing this necessary operation whenever a cautious and not over-prolonged search shall fail to reveal the true passage to the eye of the surgeon. There is no possible excuse for traumatizing these delicate structures in a vain search for something which

is as far beyond the attainment of the operator as the traditional bag of gold at the end of a rainbow. The supra-pubic route affords an infallible guide to the perineal urethra and so far as I have been able to determine adds very little in skillful hands to the risks of the operation. In fact, from a respectable list of supra-pubic operations I have no operative death to record. I wish I might be able to present so respectable a record in some cases in which I have delayed, from one cause or another, the prompt performance of this most necessary operation. In several instances the patients have themselves declined it, and one case that I recall was clearly sacrificed to vicious and prolonged efforts at catheterization in an out of the way place where no high degree of surgical skill was obtainable.

Another view of this matter is that reputable men of skill are in the last account called upon to correct the stupid bungling of the conscienceless leeches who gather the first substantial returns from the victims of acute venereal infection. How many of you have not heard the familiar cry, "I've spent all my money with Dr. Skinnem, so can't pay you and the hospital for some time to come?" Although not taken from "Hamlet" these words are quite as familiar as any ever penned by Shakespeare.

More than twenty years ago I visited a friend who told me of a world-beating discovery that had just been brought to light at Kirksville, Missouri. Some wonderful principle that had escaped all the scientific observers of the world had been unearthed by an unknown practitioner in an obscure Western town. As a matter of course, the new "science" was guaranteed to relieve all the present ailments of the flesh and several

others that might come to light in the future. It was not long before the new cult became an article of faith with thousands of people and its tenets were being proclaimed from the Atlantic to the Pacific. As Flexner says, "Crude boys and disappointed men and women" flocked to the new religion of healing by the thousands. One day I made a mortal enemy of a zealous young convert by inquiring whether he would treat a case of acute iritis by rubbing the backbone or by applying a solution of atropine. I further made inquiries of this youthful "drugless" healer, as he was so proud of proclaiming himself, as to just what means he would apply in a case of acute urethritis in the male subject. Naturally my query remained without an answer, as did another one directed to the treatment of syphilis. Well, the "pathy" has had its run and is now going the way of all others isms and pathies, but the fact remains that it never would have come into public prominence if the regular profession had given sufficient attention to the importance of mechanical therapeutics. Our patients have a legitimate right to demand of us that we shall ever retain open minds, free from all prejudice, and always prompt to adopt any measure based upon a scientific foundation that promises a helpful addition to our present means of healing the sick.

Speaking from a surgical standpoint, I am one of those who believe most heartily in the promotion of Eddyism. There is a certain class of craniums in the world, and a very numerous class at that, who ought to wander off by themselves and enjoy the sweetest of all precious delusions in imagining that they are thinking things that no other human being can possibly understand or appreciate. It really amounts to a heaven

on earth. Eddyism, in its first and last analysis, is a sort of edition *de luxe*, a jack rabbit magnified into the eloquent beast of Balaam, of all transcendental fads. It is admirably suited for silk tiles, tan gloves, patent leather boots and attar of rose, but is woefully out of joint in the modern laboratory, to say nothing of the dissecting room. I hardly know what it might do in a case of gall-stone colic or cancerous obstruction of the lower intestine. If the votaries of the blessed Eddyism pass away in peace and wear a smile after having fallen into that dreadful error of death, I suppose that no decent member of this society will envy them an unbroken slumber in the bosom of Mother Earth. We must admit, in all candor, that Eddyism outstripped all its competitors in a single bound in the selection of a name. Christian Science! Although Napoleon declared in his famous conversation on religion at St. Helena that Christianity bore no possible relation to science, it remained for a frail, hysterical little woman from Emerson's old home to demonstrate the unfailing truth of Carlyle's remark concerning the mental state of a majority of the inhabitants of the island of which London is the principal city. Some years ago a woman assured me in all seriousness that she applied the principles of Eddyism to her garden with the most gratifying results, and I felt considerably flattered when she told a neighbor that I was a man of broad mind because I told her that I believed that her "science" would be most admirably adapted to cabbage heads. I have wished for years that some one might apply the soothing principles of this wonderful "science" to radishes and also to some varieties of the onion. However, the Gospel of Optimism is a mighty force in human affairs, and we

as medical men ought to apply it whenever and wherever it may be applicable. Old Dr. Jolly, who smiles in the face of chronic rheumatism and scoffs at bilious colic will infallibly make more cures than Dr. Sour-liver, who goes about armed with a pot of lampblack in his hand and a ready made obituary notice engraved upon his stolid features.

In the unceasing warfare between science and superstition the children of light may always be distinguished from the hosts of darkness by this unfailing test: Science concerns itself with principles and principles only; superstition invariably centers its efforts about some personality. Despite the mushroom growth of fantastic fads and the apparent expansion of pretentious pathies, let us not for a moment as followers of science lose faith in the ultimate and overwhelming triumph of our principles. Even the most ignorant of our species pay unconscious tribute to scientific truth every day of their lives. One day the names of our unselfish heroes in medical science will shine brighter in the firmament of human admiration than those who have destroyed cities and deluged the face of the earth with human blood.

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## PYORRHEA ALVEOLARIS (RIGGS' DISEASE).

BY

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This disease has been one of special interest, both to the medical and dental professions, during the last few years. The utility of vaccines and of emetine in its treatment and cure, is in part accountable for this.

More and more, also, this affection has seemed to be the cause of numerous disorders in other organs, far removed from the mouth. Some of them are very serious in their outlook and require attention from physician and surgeon. Such are notably, ulcer of the stomach and gall-bladder disease.

Then, there are not infrequently, conditions of ill health, which may be attributable directly, to continual absorption of pus from the diseased teeth. In the pockets around the roots, which are shown by X-ray pictures, is found the pus which is directly absorbed, or from which an issue takes place between the gum and the tooth. When the latter is the case, the condition is now regarded as not so threatening to the general health. Even this condition must be regarded with apprehension, if it persists. The exfoliation of one or more teeth is very frequently the outcome of the unchecked disease, though the general health may not be visibly affected, at least for a while. The instances in which this is specially true are those in which there is little or no pus found at the roots of the teeth and where the recession of the gums from the teeth seems to be the primary cause of their becoming loose, until finally they come out spontaneously, or may be extracted very easily and painlessly.

Personally, up to the present time, I have had no personal experience in the use of vaccines for pyorrhea alveolaris, but have a doubting mind in regard to their efficacy. As regards emetine, I have lost faith in it, when locally used and am now inclined to believe that its use by hypodermic injections, or by the mouth, is only valuable in occasional instances.

Instrumentation on the part of a skilled dentist and where there is much deposit of

tartar, is certainly very useful. But it must not be too frequently repeated, or it results rather in injury than benefit to the teeth. Indeed, there are instances in which there is little, or no deposit of tartar around the teeth. In these cases especially, the use of a suitable astringent and antiseptic mouth wash is desirable. Such a mouth wash is indeed, useful in every case and should tend little by little, to diminish the formation of pus where it exists and to exercise a really curative effect upon the disease. Up to date, I know of no mouth wash at all equal to that of Dr. Augustus B. Wadsworth's, at present the distinguished director of the New York State Laboratory at Albany. Used three or more times daily, during many weeks, or months, it will tighten loose teeth and diminish pus formation in a way that no other mouth wash will effect, as I believe. To be effective, it must be held in the mouth from three to five minutes, or longer, on every occasion when used. The mouth wash should be diluted with two to four parts water. It is the alcohol essentially, in the mouth wash, which renders it antiseptic and otherwise valuable.

I am convinced also, by practical experience, that a little of the wash is absorbed on each occasion when it is used as I advise.

In addition to dental instrumentation and the use of the mouth wash, attention to one's general health and daily habits, must be considered as very important. I shall not touch upon diseases such as diabetes, tuberculosis, syphilis, etc., which may be causal, or greatly aggravate the local condition when it exists. I would direct attention to the fact that where there is no such disease and the individual is seem-

ingly healthy, he is a large meat eater, or an alcoholic subject.

There is undoubted evidence frequently, from urinary examinations that fermentation exists in the intestinal tract to a large extent. From this proceeds a constant auto-intoxication, which can only be met by suitable and restricted diet and especially, by diminution in the amount of meat, sweets and alcohol daily taken.

Internally, the best of all correctives, apart from occasional doses of castor oil, is the use of the bacillus Bulgaricus in pure culture, taken regularly for many months.

In all cases where disease is of obscure origin, or there is any evidence of disease in the teeth, or mouth, it is wise to have an X-ray picture taken by an expert. Despite what the picture apparently reveals, we must always remember that the interpretation of the picture is what is essential. To do this correctly, requires very accurate pathological knowledge. Even with this, one may be led astray unless we use our intelligence and knowledge of symptoms and the previous history of the patient, to help us in the wise interpretation of every individual case. I have already seen instances in which a wrong interpretation of X-ray pictures would have led to the immediate loss of useful teeth which were kept in the head and were a long while dependable, simply because of a wholesome conservatism which prevailed on the part of the medical adviser.

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**Local applications of carbon disulphide relieve neuralgia.—*Med. Herald.***

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**Goiter.**—The hot water injection treatment of goiter is valuable only in small, non-toxic forms.—*Med. Council.*

## PITUITARY EXTRACT IN OBSTETRICAL PRACTICE.

BY

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The pituitary body has always been an anatomical and physiological puzzle to scientists. The organ's remote location at the base of the brain in the sella turcica of the sphenoid bone renders it difficult, or impossible, to make practical human experiments.

The earlier knowledge was based principally upon clinical observation and animal experimentation. It is very evident that the gland contains a substance (or substances) that has something to do with metabolism and at the same time the cardiovascular system. It is assumed that the pituitary body is a governing organ presiding over some internal secretion, supporting a state of hormone balance which is essential for maintaining perfect health. Scientific investigations as well as clinical observations show that the anterior and posterior lobes are dissimilar, as extracts of these lobes appear to be physiologically antagonistic.

Pituitrin, which is prepared from the active principle of the posterior lobe, possesses the properties of an oxytocic. This claim is based upon early experiments by Dale, Froelich and Frenkel-Hochwart. They demonstrated that this extract produced contraction of the uterus of pregnant rabbits, stimulated the muscular coat of the bladder, and increased blood pressure. These results have been amply verified by many other investigators. Some have called attention to its influence upon the muscles of the bladder. When it is employed in post-partum atony it will avoid the necessity and probable dangers of catheterization.

Pituitrin, in post-operative surgery, in overcoming shock merely adds to its practical application, not only as an oxytocic, but also finds direct application to many of the post-partum conditions. It is a satisfaction of no little consequence when we can avoid many disturbances and discomforts of parturition, especially those resulting from unnecessarily protracted labor, exhaustion, depression of mother, and other complications. I have used pituitrin in over fifty cases of confinement, in none of which I have found it necessary to resort to instruments, although I feel certain that these would have been necessary in a few cases had pituitrin not been administered.

The following case reports illustrate the general behavior of my patients who have received one or more doses of pituitrin during the progress of labor.

*Case 1.* Mrs. M. D. S.—age 31 years, white, third child, called 4 a. m. 10-27-14. Normal position, given 1 Cc. pituitrin, delivered herself in 30 minutes.

*Case 2.* Mrs. G. J. M.—age 17 years, white, called 11:30 p. m. 10-15-14. Primipara, very hard labor, given 1 Cc. pituitrin, delivery in 45 minutes.

*Case 3.* Mrs. C. T. P.—age 38 years, white, sixth child, called 3 a. m. 9-15-14. Given 1 Cc. pituitrin, delivered in 27 minutes.

*Case 4.* Mrs. N. L. G.—age 20 years, called 10 p. m. 8-20-14. Primipara, given 1 Cc. pituitrin, repeated in 1 hour, very difficult case to handle, delivered 1 hour after second dose.

*Case 5.* Mrs. I. F. C.—age 26 years, called 1 p. m. 7-17-14. Primipara, given 1 Cc. pituitrin, delivered in 50 minutes.

*Case 6.* Mrs. M. A. D.—age 37 years, twelfth child, called 7 a. m. 7-4-14. Always hard case to deliver. Given 1 Cc. pituitrin, delivered in 10 minutes.

*Case 7.* Mrs. C. S. T.—age 20 years, called 8 p. m. 6-25-14. Primipara, given 1 Cc. pituitrin, delivered in 30 minutes.

*Case 8.* Mrs. E. T. G.—age 30 years, third child, called 3 a. m. 5-17-14. Given 1 Cc. pituitrin, delivered in 30 minutes.

*Case 9.* Mrs. S. H. K.—age 30 years, second child, called 4 p. m. 4-20-14. Given 1 Cc. pituitrin, delivered in 20 minutes.

*Case 10.* Mrs. E. C. C.—age 36 years, fourth child, called 3 a. m. 6-11-14. Very hard labor. Given 1 Cc. pituitrin, repeated in 1 hour. Delivered 1 hour after second dose.

*Case 11.* Mrs. G. L. G.—age 25 years, second child, called 6 a. m. 6-16-14. Given 1 Cc. pituitrin, delivered 1 hour after. Always a hard case, usually in labor 24 hours.

*Case 12.* Mrs. E. I. S.—age 29 years, third child, called 3:45 a. m. 1-17-14. Given 1 Cc. pituitrin, delivered in 30 minutes.

*Case 13.* Mrs. A. M. S.—age 22 years, called 7:45 p. m. 11-9-13. Primipara, given 1 Cc. pituitrin, delivered in 1 hour. Hard case to handle.

*Case 14.* Mrs. M. L. J.—age 25 years, called 8 p. m. 11-10-13. One of the most difficult cases to handle. Primipara, given 1 Cc. pituitrin, delivered in 1 hour.

*Case 15.* Mrs. L. H. G.—age 28 years, second child, called 4 a. m. 1-17-13. Given 1 Cc. pituitrin, delivered in 45 minutes. Protracted labor in first child.

*Case 16.* Mrs. A. G. G.—age 20 years, called 7:30 a. m. 1-3-13. Primipara, given 1 Cc. pituitrin, delivered in 10 minutes. Looked like would be very difficult case to handle.

*Case 17.* Mrs. G. M.—age 25 years, called 9:30 p. m. 2-13-15. Case when seen was in fourth position. Given 1 Cc. pituitrin, repeated in 1 hour, position changed by manipulation to first occipital, delivered in 45 minutes after second dose.

*Case 18.* Mrs. S. T. C.—age 26 years, third child, called 1 a. m. 2-13-15. Given 1 Cc. pituitrin, delivered in 30 minutes.

*Case 19.* Mrs. L. B. R.—age 37 years, seventh child, called in consultation 1-27-15. In labor 18 hours. Given 1 Cc. pituitrin, delivered in 30 minutes.

*Case 20.* Mrs. A. S.—age 42 years, sixth child, called 11 p. m. 1-22-15. Given 1 Cc. pituitrin. Child was born with congenital deformity (cord twice around the

neck), delivered in 45 minutes, child lived 24 hours.

*Case 21.* Mrs. A. E. B.—age 42 years, eighth child, called 2 a. m. 1-20-15. Prolonged labor, given 1 Cc. pituitrin, delivered in 45 minutes.

*Case 22.* Mrs. E. J. H.—age 33 years, fourth child, called 1 a. m. 12-9-14. Labor pains had ceased when patient was reached. Given 1 Cc. pituitrin, labor started and uterus dilated fully, ceased in 1 hour, again 1 Cc. pituitrin was given with like results. No effects, uterus which was dilated gradually contracted. Delivered herself four days later, 12-13-14, before I could reach case.

*Case 23.* Mrs. E. D.—age 42 years, tenth child. Call came at 5:15 p. m. 12-31-14. Reached the house at 6 p. m., immediately gave 1 Cc. pituitrin, delivered in 15 minutes.

**Summary:** Labor pains were induced in from three to five minutes, generally intermittent at first but became regular in about 15 minutes. The contraction never exhibited the character of spasmodic pain, and I observed no case of tetanus uteri in this series. There were no symptoms in either mother or child to show any untoward effect of the injected drug.

Delivery of the child hastened and expulsion of the placenta is accelerated. The uterus firmly contracts, thereby facilitating against post-partum hemorrhage, clot formation in the uterus and loss of blood.

An agreeable after effect of the remedy is its favorable influence on the evacuation of the bladder, hence its value in cases of puerperal ischuria.

The foregoing are all desirable after effects, together with the apparent more rapid recovery after the hardships of labor and points to the fact that pituitrin is proving an indispensable remedy in obstetrical practice. It can be given without danger to mother or child, keeping in mind the contraindications of anatomical obstruction

in the birth canal, a too narrow pelvis, nephritis with a high blood pressure, and exophthalmic goitre.

I should be inclined to give it late in the secondary stage in a case whose history would lead me to anticipate secondary hemorrhage.

Lastly I would advise against the too early use of pituitrin. The cervix should be well dilated and rigidity overcome before its administration; any possible dangers may be thus avoided.

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## NOSE AND THROAT DISINFECTION IN ACUTE ANTERIOR POLIOMY- ELITIS.

BY

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Before detailing my views on acute anterior poliomyelitis, I think it will be eminently fitting to make a few remarks as to the appellation infantile paralysis, the epidemic of which is so prevalent in Greater New York and which is causing such terror among the lay population that it almost amounts to a panic.

Infantile paralysis was the term given to the disease when little was known about it and when the diagnosis went no further than the paralytic manifestations. In fact unless paralysis were present the disease was either not diagnosed at all or incorrectly diagnosed. More recent studies and clinical experience have demonstrated that many of the cases, perhaps the majority of the cases, of so-called infantile paralysis present no symptoms of paralysis, and that there are several forms of the malady. Moreover, it must be borne in mind that

the condition is not confined to the very young, but that adults are liable to contract and harbor the infection. Therefore, from two points of view the term infantile paralysis is a misnomer. It is not always characterized by paralysis, nor does it attack infants solely. The name infantile paralysis has been in use for so long that it has become almost hallowed by age, but there are certain definite objections to a continuance of the term. It is not technically appropriate and in addition, and this is the main objection, it tends to create fear and spread alarm among the lay population who are naturally ignorant of the various phases of the disease and who only consider it from the standpoint of its most alarming features. It may be of advantage that the general public should view the disease with a considerable amount of terror, for if it is known to be so strenuous in its manifestations, steps are more likely to be insisted upon to abate or stamp out the infection. Nevertheless, it is not a wise policy to aggravate unduly its deadliness and to furnish to the daily papers material for sensational and lurid accounts. The community at large should be educated as to the true nature of poliomyelitis and should be made acquainted with the main facts, so far as they are known, concerning the disease. The meeting held under the auspices of the New York Academy of Medicine on July 13, 1916, was a step in the right direction, and the dicta of the authorities on the subject there present, illuminated in the minds of the ordinary individual several points in connection with poliomyelitis which had been obscure.

However, when all has been said that can be said regarding the disease it must be confessed that our knowledge is not nearly so accurate or precise as might be desired.

The following salient facts we do know. That acute anterior poliomyelitis is of infectious origin. In Sweden the malady has been prevalent for a considerable period of time and Swedish investigators have delved into the matter most deeply, and have laid the foundation of our existing knowledge. This has been added to by investigators of other countries, of which undoubtedly those of America have been the most prominent. Indeed this country has every reason to be proud of the results towards the solution of the problem of its etiology achieved by workers of the Rockefeller Institute. To Simon Flexner is undoubtedly due the chief honor of discovering the microbic origin of poliomyelitis. It is an extremely minute almost infinitesimal microorganism, filterable, has been secured in artificial culture and as such is distinctly visible under the higher powers of the microscope. The virus which is communicable invades the central nervous organs and gains access to the body, by the nose and throat, as it is found constantly in the mucous membrane of the nose and throat of persons suffering from the disease. It is likewise found constantly in the intestines of patients, less frequently in the other internal organs, while it has not been detected in the circulating blood. The virus has been detected by inoculation tests on monkeys and these animals have developed a disease similar to acute anterior poliomyelitis in human beings. Thus it has been determined that the mucous membrane of the nose and throat of healthy persons who have been in close contact with acute cases of poliomyelitis may become infected with the virus, and without developing symptoms of the disease themselves may act as carriers, and convey the infection to those they meet and particularly to children, who may be attacked by the mal-

ady in its most virulent forms. This is a feature of the disease upon which much stress must be laid, for in the opinion of many of those who have studied the question carefully, it is by such means that infection is mainly spread and it seems likely that by promptly diagnosing the presence of the virus in these innocent carriers and by rigorously carrying out measures of isolation that an epidemic of acute anterior poliomyelitis may be quickly nipped in the bud. The difficulty lies, of course, in the inability of physicians to diagnose the existence of the microorganism in persons apparently healthy, and up to the present this difficulty has proved insurmountable. Yet there are many preventive measures at hand which serve to stay the spread of an epidemic. M. N. Neustaedter was the first to prove that the nasopharynx was the point of entry of the virus and as he has pointed out in an article in the *New York Medical Journal*, July 22nd, 1916, it is conceivable that its mode of dissemination may be through direct contact or indirectly through persons, living animals or dead objects. House pets may carry the virus from place to place; toys, books, linen may likewise carry infection, and most of all dust is the greatest disseminator of the disease. That dust was a potent means of spreading the infection was proved by Neustaedter who produced the disease experimentally in monkeys from dust of the sick room; his results were confirmed by Swedish investigators. With regard to insects as conveyors of the infection opinions of authorities are somewhat at variance. Flexner is inclined to minimize the role of insects in this direction and appears to regard the insect as a negligible quantity in the dissemination of the infection. At any rate, it has not been proved that insects act

as hosts of the virus. Experiments in this connection have been negative. It was demonstrated, however, that the biting stable fly could withdraw the virus from the blood of infected and reconvey it to the blood of healthy monkeys, which became paralyzed. Further experiments failed to confirm the earlier ones and as Flexner has aptly pointed out, experimentally inoculated monkeys differ in one way from human beings suffering from poliomyelitis in that while the virus may appear in the blood of the former, it has never been detected in the blood of the latter. But although insects may not act as hosts of the virus, the domestic fly may become contaminated with the virus contained in the secretion of the body and serve as the agent of its transportation to persons and to food with which they come into contact. Domestic flies experimentally contaminated with the virus remain infective for 48 hours or longer. Flexner allows that while our present knowledge excludes insects from being active agents in the dissemination of acute anterior poliomyelitis, they nevertheless, fall under suspicion as being potential mechanical carriers of the virus of the disease. Many authorities go much further than Flexner and stigmatize the domestic fly as not only a probable but an obvious sinner in this respect. If the germs are found in the dust of the sick room, as they have been found, surely flies can convey them from place to place and be active means of spreading infection. Personally, I am of the opinion that flies are conveyors of the disease to a large extent and that this affords another strong reason, to the already long list of reasons, why the domestic fly should be eradicated as far as is possible. Also granted that the germ is found in the dust of sick rooms, and that dust is

carried where the wind listeth, then it follows logically that articles of food may be contaminated and may be the cause of infection by coming into contact with the pharynx. Especially may milk and water become infected in this manner and be carriers, since the virus has been shown to remain viable in them and retain its virulence for more than thirty days. The fact, therefore, that dust provides a medium by which infection may be spread far and wide supplies an unanswerable argument for cleanliness. Houses should be kept scrupulously clean and the floors of rooms in which sufferers from poliomyelitis are or have been should be subjected to thorough scrubbing. Streets and sidewalks should be flushed frequently and thoroughly for as Neustaedter says, it must be borne in mind that people spit on the streets and children play on them.

As I take it, the most outstanding features of acute anterior poliomyelitis are, that it is a germ disease, that the virus gains entrance by way of the upper respiratory tract, that persons apparently well may carry the germs in the nasopharynx region and may infect those susceptible to the infection with whom they may come into contact, and that it may be conveyed by dust. These facts immediately suggest to a nose and throat specialist like myself, that both from the preventive and remedial points of view disinfection of the nasopharynx should be promptly undertaken. It has been shown according to Neustaedter, that the virus is readily destroyed by menthol and hydrogen peroxide, and he has strongly advised that the nasopharynx of the sick be frequently sprayed with a one per cent. solution of peroxide of hydrogen and that of healthy children be sprayed with a solution of 0.5 per cent. menthol in

liquid petrolatum. I am quite in accord with these measures and append a list of prescriptions which should be of value in the prophylactic and remedial treatment of acute anterior poliomyelitis. We have a large number of remedies which have anti-septic and disinfectant properties when used in solution in the nose and throat, as phenol, boric acid, menthol, iodine, ichthyol, eucalyptol, peroxide of hydrogen and salts of mercury. The following are formulas which suggest themselves to me as likely to meet the exigencies of the situation:

Iodine ..... gr. vii.

Kali iodide ..... gr. x.

Glycerine ..... 3iii.

Aqua ..... 3iii.

To be applied on cotton to the mucous membrane of the nose and throat.

Ichthyol ..... 3i.

Glycerine ..... 3i.

To be applied on cotton to the mucous membrane of the nose and throat.

Menthol ..... gr. iii.

Camphor ..... gr. iv.

Ol. cinnamon ..... mii.

Liquid albolene ..... 3i.

To be used in an atomizer as a spray.

Peroxide of hydrogen and  
Aqua Menth. Pip..equal parts.

Four teaspoonfuls to half a glass of water for gargling.

Yellow oxide of mercury...gr. x.

Vaseline ..... 3i.

Apply to the inside of the nose several times daily.

Sodium chloride and soda bicarb.  
of each ..... equal parts.

3i to a quart of hot water, temperature 100 for cleansing nose and throat.

A paper which appeared in the *British*

*Medical Journal*, July 1, 1916, written by Lieutenant-Colonel M. H. Gordon, R. A. M. C., discusses the successful disinfection of the nasopharynx of meningococcus-carriers by means of air saturated with a solution of a disinfectant. In this paper Gordon describes experiments undertaken with the view of ascertaining whether persons carrying the meningococcus in their nasopharynx can be freed of that microorganism by carrying them to inhale the air of a room saturated with a vapor containing a disinfectant. The disinfectant used in the investigations was chloramine and the conclusions arrived at as the result of the experiments were as follows.

1. The air of an ordinary room, when brought to a point of saturation by means of a steam spray containing 2 per cent. of chloramine, acquires pronounced bactericidal properties for staphylococcus epidermidis.

2. Such air can be tolerated by human beings for a period varying from six to twenty minutes without marked discomfort and without harm.

3. When inhaled through the nose, this air succeeds in destroying the meningococcus in the nasopharynx of carriers.

The method is simple and convenient and on account of its obvious suitability for the purpose of dealing with a large number of carriers at a time, it would seem that a similar method might be tried in order to disinfect the nasopharynxes of those who are suspected of being carriers of the virus of poliomyelitis, or of those who have been in contact with infected individuals. The method may be recommended to the consideration of the New York Department of Health. It may be stated without reserve that there is no specific in the treatment of acute anterior poliomyelitis or indeed any remedy which appears to act with much influence on the progress

of the disease. The chief mode of successfully combating an epidemic of this character lies in preventive measures rigidly enforced, as isolation of the infected, strict cleanliness in all parts of a city or district, in which the disease may be present, including the wholesale massacre of flies, and also, perhaps, the abolition of domestic animals from congested areas. The crux of the entire problem of the eradication of poliomyelitis hinges upon the early diagnosis of cases and especially of seemingly healthy carriers, in order that efficient steps may be quickly taken to render such persons incapable of spreading the disease. I, therefore, urge that disinfection of the nasopharynx should be carried out, as far as possible, not only in cases in which the germ has been demonstrated to be present but in suspected cases.

157 West 105th Street.

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## EPIDEMIC POLIOMYELITIS; CIVIC AND INDIVIDUAL HYGIENE.

BY

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Cursing the New York City government and its health department and the germ will not help us a particle in this epidemic; it is in the home that the fight must be made and those in the home can not fight it if they do not know how; we have no specific for its cure but we do know that a clean child in a clean house in a clean street may play with any number of clean companions and be safe; we do know that the cleanliness must include the nose and mouth of the child and that salt and water (teaspoonful to a quart) is a safe and non-irritating nose and mouth wash; we do know that clean bowels

do not intoxicate a blood supply and that a little sweet cascara (teaspoonful) will accomplish this; we do know that accumulated and uncovered food waste forms a picnic ground for flies and other disease carrying insects; we do know that soap and water on a child's body and in the home sweetens up things wonderfully and we do know that the smell of camphor about a child not only stimulates the circulation in the upper air passages but is a constant reminder to the child and those about him that "preparedness" is the watchword; we do know that the force of example is strong and a dirty child finding himself shunned will demand and receive the cleansing which will make him *persona grata* among his playmates. Knowing these things let us practice and preach them to our own patients personally and to the other fellow's patients through the medical and lay press.

The health, police, street-cleaning and fire departments should form a special epidemic board with the powers of all combined; the police to enforce the sanitary laws and not permit a vacant lot in a crowded district to be used as a dumping ground for filth and to remain so for four weeks in an epidemic period until forced, by a citizen, to report it for cleaning; the street cleaning department to keep the streets clean of refuse and swept (*with* the wind, not against it) and to flush those streets in infected areas which are not reachable by the fire-houses; the fire department to detail one man in each engine house to flush the streets for six square blocks around the engine house where he would be within reach of the sound of the engine whistle or a messenger to cease his drain on the water supply if necessary; the board of health with these adjuncts can then devote itself to proper supervision; when there is a panic in the finan-

cial market the clearing house works twenty-four hours a day in shifts, and the New York Health Department headquarters should not be closed for an instant; the employee who is not willing in a crisis such as this to work overtime, or take his turn at night work, should give up his place to one who will; the mere technicality that no contract has been let for picking up foul driftwood from a canal like the Gowanus canal in Brooklyn should be brushed aside and the canal cleaned by days work; we will not jail the health commissioner for spending money without authority but the city will gladly pay the bill and pat him on the back for his public spirit and moral courage; we are paying plenty of bills for luxuries and I am sure we can afford this necessity. Finally, our officials should enforce a real quarantine; if the newspaper reporter can uncover a host of violations surely a health department official or employee can. If enough lay employees are not at hand let the physicians of one bureau who are duplicating the work of other bureaus go out on epidemic and quarantine duty, and if there be not sufficient of these, put the nurses to work and take them away from elaborate card indexing; statistics can not stop an epidemic.

Let the doctors play fair with the department of health, reporting cases promptly and when accorded the privilege of keeping patients in their own home, let them see to it that a proper quarantine is maintained. A family that will resent the reporting of a case, or fail to comply with reasonable quarantine regulations, is no more capable of remaining loyal to an over-obliging doctor than they are to their neighbors and their neighbors' children; nor should they remain loyal, for a doctor who will jeopardize the health of a neighborhood is not worthy of the confidence of the individual or the pub-

lic. The great pity of it is that we can not reach him and strip him of his power to undermine the public health.

397 Union St.

## THE SURGERY OF POLIOMYELITIS.

BY

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Stimulated by the great increase in cases of deformity resulting from the epidemic of 1907, the surgery of poliomyelitis has during recent years undergone progressive development both in methods and technic and is still in a stage of evolution toward higher standards.

In no field of surgery is ripe experience and sound judgment more important, for only by experience can the uselessness of certain widely used procedures be determined and only by sound judgment can the ever varying conditions be advantageously met.

It is evident from the large number of patients applying at orthopedic hospitals for further correction of their deformities, after having submitted to two or three operations, that there is need for standardization of methods and for the application of radical measures in the first instance. In looking over the causes of failure, certain basic conditions appear to be accountable. Most of these operations are done on young subjects and the fact has been too vaguely understood that plastic bone work on the young is usually followed by fibrous rather than osseous union, and that new fibrous

tissue when subjected to strain is prone to stretch and permit at least partial relapse into secondary deformity. The prevention of such results is obviously the application of sound mechanics in whatever remodeling operation may be undertaken with a view of relieving the newly formed fibrous tissue from strain, and it is toward this end that operative technic is gradually developing.

In tendon work, whether it be transplantation or fixation, disappointment is frequently due to the utilization of tissue already impaired by disease which in the nature of things is unable to withstand severe strain. Only by the observation of a large number of cases done by many operators can one grasp the fallacy of much of the tendon work now done, giving apparently brilliant immediate effects and useless final results. The writer's opportunity for reviewing the material at so large an out-door service as the Hospital for Ruptured and Crippled, where the failures from many sources appear for further advice, has led to a belief in the conservative side of tendon work and he desires to emphasize the necessity for careful judgment in the selection of cases for surgery of this nature.

Another field where lack of judgment ends in failure is in the transplantation of muscles. It would seem as though the elementary foundation of such a procedure would be the selection of an unimpaired muscle to replace the one paralyzed, and likewise the selection of a muscle of sufficient normal power to do the work of the useless one. Unfortunately, the hope of improving a helpless member has often led to the transplantation of a muscle unequal to the task assigned to it and the result is, consequently, failure to achieve practical results.

It is an old adage that we learn more by

our failures than our successes, and, profiting by their own disappointments and those of others, surgeons with the opportunity for observing a vast amount of post-operative material are gradually developing methods to overcome the deformities of poliomyelitis which insure permanent results in restoring to a fair degree of usefulness paralyzed limbs which seemed hopeless. In a paper of this nature it would be out of place to discuss individually the work of each contributor to the really brilliant achievements of the past ten years. It will be sufficient to point out what may be done to improve the conditions of the victims of poliomyelitis.

Surgery in this field aims at three things. First, the correction of deformities, chiefly contractures, to permit the use of braces; second, the restoration of solidity to unstable ankles and feet; third, the transplantation of muscles to replace others which have been paralyzed.

The first group of deformities which include contractures about the hip, knee and ankle, and when present preclude the proper fitting of a brace, are easily overcome by division of the contracted tendons and immobilization of the limb in the corrected position for eight or ten weeks while the gap between the severed tissues is filled in. The results of the operation are satisfactory and permanent, if the leg is thereafter protected by a proper brace.

Deformities of the foot, no matter how severe, may practically always be corrected, and it is in this region that the ingenuity of the surgeon has had the greatest latitude owing to the varying types and degrees of disability which occur. It is here, also, that judgment is essential both in the choice of operation and the manner of its application, and it is here, too, that failures are most

common, and successes most satisfactory, for the foot is the foundation of the weight bearing structure.

The typical deformities encountered are equinus, equino-varus, valgus and calcaneo-valgus in degrees varying from moderate weakness to complete dangle-foot. It has been customary for some years to treat the milder disabilities by means of tenotomies and arthrodeses. That is to say, by dividing contracted tendons and denuding the articular surfaces of involved joints of their cartilage, expecting fibrous union to occur and firmly hold the lax joint. The proportion of ultimate failures following this technic is far beyond reason. The fibrous tissue thrown out in joints so treated does not resist strain well, hence the very frequent occurrence of secondary deformity at the end of a year or two. Experience suggests that more thorough measures, to be referred to presently, are indicated to insure permanent results.

Tendon fixation was introduced by Gallie, of Toronto, a few years ago for the purpose of controlling both drop foot and calcaneous deformities. This is accomplished by imbedding the proximal portion of the affected tendon in a groove cut into the tibia, sewing the periosteum over it, and implanting the distal portion in the foot, thus forming a ligament to check abnormal motion. The procedure is effective in properly selected cases or as an adjunct to other operative work, but its application appears to be limited for the reason that the tendon of a paralyzed muscle will often stretch and in time cease to fulfill its office as a check ligament.

Mild cases of varus may be permanently controlled by removal of a longitudinal wedge of bone from the outer side of the os calcis which changes the bearing point of

the heel, throwing the weight on the inner border of the foot. This is a simple mechanical means of controlling mild conditions of this type, the principle underlying which has until recently been overlooked.

The lighter forms of valgus may be controlled by a similar wedge removed from the inner side of the os calcis, but usually such disabilities are so well controlled by a special foot plate which tilts the heel that they seldom come to operation.

In the severe types of foot instability there has been an increasing resort to astragalectomy, following the technic of Whitman, with a large proportion of satisfactory results. This involves removal of the astragalus with displacement of the foot backwards and the implantation of the ends of the malleoli in recesses provided for them on either side of the tarsus. When properly done, a permanently stable foot results with good anterior-posterior motion.

A somewhat less radical method of stabilizing the foot has been devised recently by the writer which applies equally well to moderate and severe grades of deformity and, having for its basis a purely mechanical blocking of abnormal motion without dependence on fibrous tissue formation, appears to be well adapted to its purpose. This operation takes cognizance of the mechanical problem presented in cases of instability of the foot following paralysis which is the restriction of anterior-posterior motion at the tibio-astragalar joint and lateral motion between the os calcis and astragalus. Control of either of these joints without control of the other will yield imperfect results, hence the operation under consideration aims to efface the astragalo-tibial joint and to drop the external malleolus down sufficiently to overlap the os calcis, thus blocking lateral motion between this bone and the astragalus. (See Fig. 1).

The foot also offers opportunities for tendon transplantation when a single muscle such as the peroneus-longus or the tibialis anticus is weak with some power remaining. It is at the knee, however, that the most striking results of muscle transplantation occur. Where the quadriceps is paralyzed and the hamstrings are strong and ac-



FIG. 1.—Diagrams showing bone incisions, indicated by dotted lines, and assembly of remodeled bones in Roberts's operation for paralytic instability of the foot. A, astragalus; B, tibia; C, os calcis.

tive, one of the latter may be carried forward and attached to the tendon above the patella. The result is restoration of power to extend the leg on the thigh or at least to keep the knee from bending when weight is placed upon it and thus overcome the necessity for wearing a brace.

The use of heavy silk to elongate tendons as described by Lange, and the silk check ligaments of Bartow, both have their uses under proper conditions, but are to be advised only when one is entirely familiar with the technic of their originators.

In conclusion it may be said that the field the field of surgery in the treatment of deformities following poliomyelitis is exceedingly broad. There is scarcely a malposition of the lower extremity which cannot be improved, and the correction of deformity leads to better use of those muscles in which latent power remains and to their consequent development. It is, however, a department of surgery in which experience and sound judgment are essential for the achievement of permanent results.

## THE BIOLOGICAL ASPECT OF WAR.

BY

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The much-repeated saying that civilized man has always desired peace is false. He has often said so quite loudly, but his true feeling is shown by what he does, rather than by what he says. Infants, being heirs to the ages of human tyranny and selfishness on earth, exhibit in their constitutions the historical instinct of the race when they fight in their mother's arms, and when they try to destroy insect life as soon as they get the opportunity.

History is in the main a monotonously hideous record, and pre-history probably a long oblivion of successions of wars and slaughters, of improvements in the means and weapons of warfare, and of the glorification of those who have successfully engaged in war.

Through the succession of ages, in the revolution of things which has been christened evolution, nations have grown great, have later declined, and have eventually perished in conformity with the law of organic construction by means of organic destruction. In the same breath in which prayer is made to Heaven for peace on earth, another prayer is offered for victory over the enemy in battle, and with the same voice with which men deplore war, they loudly extol the triumphant victor and his victory. No event in the history of a nation produces such exultant excitement and jubilation as the news of a successful naval or military engagement. In the churches high dignitaries hasten to give devout thanks to God, although the church is the place, and its ministers the persons, specially consecrated to celebrate the gospel of peace

on earth and the brotherhood of mankind. All of which, although it may seem most incongruous to many people, is the natural and necessary effect of the belief which works actually in practice; it is faith proven by works.

It can safely be said that to be amazed and aghast at the spectacle of monstrous inconsistency between profession and practice is to exhibit shallow thought and idle wonder. When was it ordained that men should be consistent? They have not been so up to now on our planet, and nothing is more certain than that for an incalculably long time to come they must, unless they discard the aspiration to rise to higher being, continue at the same time to pray for and prey upon one another. Of what importance is it to the universe, which itself is an equilibrium of antagonisms, whether human nature is consistent or inconsistent, so long as by its consistencies and inconsistencies the cosmic work is done, and the will of destiny is accomplished?

For the present perpetual peace among men is not likely to be realized on earth so long as man continues to be the being which he is, and not an ideal something which, whatever it might be, would not be man.

Opinions are strangely divided as to whether war is the curse which it seems to be, or a blessing in disguise. The doubt is only a single instance of the eternal puzzle which perplexes all thinking men every day. On the one hand are those who condemn war utterly as immoral and most injurious, and who foresee a time when the human race will progress smoothly on ethical paths; on the other hand are those who see in war and in the heroisms, self-devotion, and sacrifices which it involves a purifier of nations from the corruptions which peace and prosperity produce.

Viewing the facts in the light of what appears to be reason, there has been in the past plain proof of its necessity; it has been because it was inevitable, for it has been the indispensable condition of the progress of organic matter in human form to loftier heights of being. The truth is that the development of higher life is at the cost of lower life, however the crude fact may be embellished in the higher organic sphere by show of gallantry, heroism, and other ornaments of conduct, because it is certain that the glories of war on the one side can only exist at the cost of defeats and deaths on the other side.

The question remains whether war must continue to be a necessary condition of progress among peoples who have reached an almost equal level of moral existence. Can they rise, or even maintain their moral stature without war? Or is the inevitable effect of accumulated organic matter to foster corruptions which, if not discharged in some violent way, initiate and promote general degeneration? This is a problem which, notwithstanding optimistic assurances, time and experience alone can solve.

In the present condition of the most civilized peoples, however, there is some excuse for the pessimist who believes that, savage, brutal and cruel as men were in the past, they are baser, meaner and more corrupt at the present day. The savage who openly scalped his enemy in war was a less ignoble animal than an up-to-date ruler or commander-in-chief who, through what he calls "military necessity," resorts to methods of killing which his government has specifically agreed by treaty to abstain from using.

425 Porter Avenue.

## THE PHYSICIAN OF YESTERDAY.

BY

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No century in the world's history has seen more marvellous advancement in medical science, replete in methods contributing to our happiness and longevity, than has been witnessed in the past score of years. We have seen pestilential Panama changed into a health resort. We have seen the plague ports made clean. We have seen the death rate from preventable diseases cut in two. We have seen the stinking membrane of diphtheria melt away in a single night, under the curative influence of antitoxin. We have seen our army encamped in the fever-infested swamps of Texas and remain immune from typhoid. We have seen the marvels of the X-ray, of radium, of mesothorium, and yet in the years that have elapsed since the death of Rousseau, no great book upon the practice of medicine has been given to the medical profession. Why should Rousseau's work, though written nearly half a century ago when little was known of pathology, bacteriology and metabolism, remain a classic to this day? Because he treats his patients at the bedside and not in the laboratory. The trouble with the modern medical author is, that he has lost sight of the patient altogether.

The sick man is to him, what wild-rice is to the duck-hunter—pabulum for his favorite birds. What should interest the medical man is not the gross or minute pathology of an organ, as seen micro- or macroscopically, but the methods by which he may improve the workings and incidentally the feelings of that same organ, before the patient is turned over to the pathologist. Pathology is a fascinating, important and

instructive study, but not intensely interesting to the patient.

It has been said that a certain voluminous writer on medical subjects might use Central Park for a waiting-room and still have an overflow. If this statement be true, one may easily understand how he could spare a few of his more interesting cases for slide material, but at the present writing the vast majority of the rank and file have no such plethora, and are perforce more interested in keeping what patients they have, than proving their diagnosis by a post-mortem. I have all the respect and admiration in the world for the scientist who publishes his conclusions upon the effect of digitalis and strychnine on the heart of a healthy frog, but what interests the ordinary doctor more, is the action of those same drugs on a leaky human heart, when the patient is drowning in his own secretions.

Ninety-nine percent of those wonderful tests have in time proven themselves unreliable or false and the other one percent would have no working value to the man behind the medicine case, had it not been for the activity of the pharmaceutical firm, which placed the resultant product on the market in a usable form. No doubt the manufacturer of drugs is out primarily, as is the editor of the system, for the doctor's dollar, but he is giving said doctor something tangible for his money.

You may easily imagine the chagrin which awaits our old friend, Doc. Mudsock, of Rattlin Brook, Vt., when he opens his medical journal and endeavors to keep abreast of the times reading "serologic manifestations in hyperlymphocytic tabo-paresis" and articles of this kind, written by ultra-scientific embryo physicians attached to some famous clinic. This may be the only medical journal the doctor sees and who shall blame

him if he develops a taste for novel reading when physicians who never have nor who never will practice medicine are allowed to fill page after page of his periodical with tables and statistics, whose legitimate place is in a journal devoted to experimental medicine? The writer recently purchased a widely advertised "system" on practice of medicine and had visions of the pleasant hours he would spend by his "ain fireside," increasing his repertoire. He was doomed to disappointment however. When referring to it for help in his doubtful cases, these wonderful books took him on a blithe journey, through the ancient and modern history of the disease, its etiology, its pathology—citing cases where the author's diagnosis was proven at the dead-house—and dismissed the subject with a few unimportant words on treatment. I have no quarrel with this distinguished author when he states that typhoid is a self-limited disease and that drugs are not indicated in its treatment but if he can manage a case of typhoid fever in my village without drugs and get away with it, his diplomacy entitles him to the post of ambassador to the Court of St. James.

Minute pathology and the ability to make the finer diagnostic tests with instruments of scientific precision are admirable qualifications in the recent graduate, but who has not seen these "test-tube physicians" fail in a community where their less scientific brother waxed fat? The majority of these estimable young men look back with pity and contempt upon the work of the older physicians. It is the modern mistake to confound empiricism with tradition and age with fogyism, for the physician of 50 years ago held a far higher place in the community and was far more respected and loved by the laity than is the physician of to-day.

It must be evident to even the most casual observer that more time is spent in the laboratory than at the bedside, by our elaborate methods of culture, incubation and in the making of autogenous vaccines.

Procuring samples of blood or stomach contents, the injections of serums and vaccines and the reactions from such injections are very distasteful to most patients; more especially if they have recovered from a similar illness, under the old regime. The old physician knew nothing of modern methods, but had a high regard for the efficiency of certain drugs, which the patient was taking at stated intervals. We may easily understand how much of this faith (blind though we admit it to be) might be transmitted to the patient, who thus received the benefit of therapeutic suggestion during the intervals between the doctor's visits.

Again, the old physicians paid much attention to sweating, hot and cold packs, to rubbing with many and varied oils and liniments, but more important for the argument in hand, he carried out these procedures himself. No trained nurse in the olden days divided the patient's affection for the physician. Do not misunderstand me. I am not making a plea to go back to the old regime. I am not belittling the value of modern methods. My argument is this: in our headlong rush after the new, the evanescent and the elusive, we have thrown aside such valuable therapy as suggestion, hydrotherapy and massage and as a result lost much of the devotion of our clientele and have driven many of them into the net of the quack and charlatan, who have arisen to the cry of the multitude who want something tangible done.

Without seeking further the cause of this declination of the physician in public favor,

let me admonish the younger generation of doctors against attempting to belittle any therapeutic agent of whose action and constituents they are uninformed, lest "truth crushed to earth will rise again."

The writer is loath to confess that he was one of the mob of progressive physicians who cried "Crucify Him," when the medical practitioner of 25 years ago continued to treat his purulent appendix cases by absolute rest, starvation, keeping the bowels in splints with opium, bringing the respirations down to 10 and even 8 to the minute and applying hot poultices to the abdomen. When the pus had been confined to the abdomen for several weeks, and had lost its virulence or when the body had furnished enough antibodies to take care of the pus-forming bacteria, he then lanced the abscess and strange to say his patients got well and stranger still under our regime of cutting open every belly that had pus in it, many of our patients died.

The writer was also one of an admiring group, who sat in the operating room of the Augustana Hospital at Chicago and listened to the man who has become famous the world over on account of his (Ochsner) treatment for suppurative appendicitis. He informed us that his treatment consisted of absolute rest in bed, no food by the stomach to lessen peristaltic action, giving opium until the bowels were in splints and until the respirations were 10 or even 8 to the minute to favor pooling of the pus and feeding by the rectum. Fowler's position and Murphy's proctoclysis is also part of the classic Ochsner's treatment but in the main his new treatment for suppurative appendicitis is the same as that which we threw into the discard over 25 years ago. Truly we progress in circles.

Those of us who began the practice of

medicine at this time have seen the old school physician bleeding his plethoric pneumonics, his cases of eclampsia and his patients suffering from pulmonary edema. We have seen such treatment scorned and reviled and possibly assisted in this "stoning of Stephen" ourselves, yet when we read Forchheimer's *Therapeusis of Internal Diseases* (1914 model) we will see that blood-letting is considered a life-saving measure in just such cases, as it lowers blood-pressure, relieves an overburdened right heart and lessens the number and toxicity of the bacteria in the system. In the words of the old-school physician, "It lets out some of the bad blood."

A score of years ago, to speak of setons or issues as therapeutic agents in cases of internal inflammatory conditions would call down upon you withering satire or at least pity for your antiquity, but in the late Prof. Dieulafoy's work on practice, he recommends highly the fixation abscess in pneumonia, produced by the hypodermic injection of spts. turpentine.

But why continue? The foregoing instances might be multiplied indefinitely, yet it is a healthy sign to see an occasional writer on therapeutics, wearied by his endeavor to extract all healing principles from the elusive microorganism, turn back to the medical scrap-heap for valuable material discarded by the progressives for over half a century.

Much credit must be given the better class of American manufacturing chemists for their share in the perfection of many of the drugs which have stood the test of time. Their conservatism is worthy of emulation by their more avaricious foreign competitors, who have a higher opinion of the American dollar than of the American doctor. Many therapeutic satellites have il-

lumed the medical sky in the past 25 years. Practically all of them have vanished. Over-enthusiastic writers have flooded the medical periodicals with tons of literature exploiting these marvellous discoveries.

The old fluid extracts are unknown and drugless drugs are in the ascendant. However in spite of the blatant enthusiasm about our wonderful generation, in spite of our regret that the medical fossil, who died 25 years ago, could not be with us now to see a real doctor in action, we must admit that the armamentarium which we may take to the bedside of our patient has not materially increased. Let us see how many grains of wheat we have gleaned from these tons of chaff. What have we today that our old preceptor lacked? A curative and preventive serum for diphtheria. A preventive serum for tetanus and a preventive vaccine for typhoid. Cocain the local anesthetic. Pituitrin the oxytoxic. Hexamethylamin the urinary antiseptic. Adrenalin the hemostatic. In this list perhaps I should have included salvarsan, but by the way its stock has slumped in the past two years, I have hesitated. Hailed at first as a "Therapia sterilisana magna," its most ardent admirers now advise its repetition at 10 day intervals for several doses. Many prominent syphilographers go so far as to say it has no advantage over the mercury and iodide treatment, which is infinitely safer and easier of administration.

Let us then be not over-enthusiastic about the qualities of the new, nor iconoclastic regarding the therapeutic idols of the olden days, but let us pray that the time is not far distant, when another good clinician like Rousseau, will write a book on medical practice, that all physicians, aye and even surgeons, may read and understand. Like this old master he must have

the seeing eye, the listening ear, that diagnostic sixth sense (that depends not over much upon the stethoscope and microscope), the magic art of stripping his pages from all verbosity and persiflage, the faculty of hewing close to the line and finally he must have that rare gift of separating the few grains of fact from the dust of uncertainty, that has enveloped therapeutics for a quarter of a century. The generation of physicians just passed will be known to posterity not only as a generation great in achievement, but as a generation of monumental fallacies.

To prevent a continuation of error, we should begin with the first year medical student. It is the writer's firm belief that the time is not far distant, when the making of a doctor will revert in a great measure to the older methods. The lecture room with its multi-colored charts will be but a memory and medicine and surgery will be taught as mechanics is taught in Germany. A group of students will be apprenticed to a master workman, who will teach them the mechanism of man and how to repair the gears of the human body. The teaching will not be done in frescoed halls, but at the bedside and in the operating room. The student whose mind is occupied with society meetings, frat banquets, athletics, and other time-consuming devices will be discarded early, that he may not contaminate others, and be sent home where he may pursue his calling at his leisure. The medical colleges will donate their picture books to the kindergarten and the nursery and begin to teach such subjects as massage, hydrotherapy and suggestion, thus driving from the land such ignorance as osteopathy and Christian Science.

Professors of tomorrow will spend more time in preaching and practicing the art of

preventive rather than curative medicine. The doctor of tomorrow will educate his clientele to give their bodies as good care as they now give their motor cars and lay them up a week or two each year in a hospital and allow a master workman to see if the starter is working, the timer in unison and if any of the delicate machinery of the body needs adjustment.

Our universities following the example of those in Britain will divorce medicine and surgery and give separate degrees for each. Again emulating the sister country our curricula will include an important specialty, public health. A completion of this course will admit the physician to the degree of D. P. H., thus encouraging communities to choose their health officer by ability and not by political preferment.

The postal authorities will make the blatant quack fulfil his contract or quit, and publicity will drive the diploma mills out of business.

The title of "Doctor" will be made to signify something definite or be given over to the osteopath and the piano-tuner. The holder of an American degree will be admitted to examination in Britain upon the same terms as his Canadian and Australasian brethren, and will not be viewed, as he is today, with suspicion and scepticism.

The past generation has seen this country advancing in arts and sciences that make prosperity, by leaps and bounds. Many physicians and surgeons, in their anxiety for preferment, have at times forgotten their Hippocratic oath, but the writer is firm in the conviction that the future is big with promise. The tree of medical knowledge, endeavoring to keep pace with the growth of the country has become too heavy, but the past few years have seen many of its dead and dying branches cut

away. A continuance of this pruning will dehorn the ancient tree very thoroughly. Its fruit will not be as great in quantity, but at least it will be better in quality.

The American doctor of tomorrow will not be a subject for buffoonery in the comic supplement. The work of the American leaders of our profession, in sanitation, surgery and medicine is beginning to be appreciated by the thinking world.

Let us hope that chastened by our mistakes of the past, we may regain that devotion and loyalty of the people which has been ours since the earlier ages, as is proven by the writings of the immortal Homer. In Book XI of the Iliad, he thus speaks of the Greek physician, who was wounded by Paris.

"The spouse of Helen dealing darts around,  
Had pierced Machaon, with a distant  
wound:

In his right shoulder the broad shaft ap-  
peared,  
And trembling Greece for her physician  
feared.

To Nestor then Idomeneus begun:  
Glory of Greece, old Neleus's valiant son—  
Ascend thy chariot, haste with speed away,  
And great Machaon to the ships convey.

A wise physician, skill'd our wounds to  
heal,

Is more than armies to the public weal.  
Old Nestor mounts the seat: beside him  
rode

The wounded offspring of the healing god.  
He lends the lash; the steeds with sound-  
ing feet

Shake the dry field, and thunder toward  
the fleet."

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**Antidote for Carbolic Acid.**—A com-  
mon antidote for carbolic acid is alcohol,  
but cider vinegar is equally good and often  
more handy.—*Medical Summary.*

## PELLAGRA: REPORT OF SIXTY-SIX CASES IN THE ALABAMA IN- SANE HOSPITALS.

BY

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The purpose of this report is to furnish a little more data to those who are endeavoring to discover the etiology of pellagra.

This institution has an excellent water supply from natural springs. The food is well prepared and there is a sufficient quantity of a well balanced ration. If anything, there is an excess of proteids, as the patients get lots of field peas, beans and beef. The question arises "did these patients take this balanced ration?" Yes, several of them are very intelligent patients who eat well. I have studied them and learned their likes and dislikes for various foodstuffs, finding them about those of the average negro.

The state of health of the cases that broke down was fair, and that of several of them was good.

The hygienic conditions are those that can be expected in any well conducted insane hospital; however, things are kept as clean as possible, with the patients coming in close contact with each other. The sewerage is good.

We do not isolate the pellagrins.

The records below cover the sixty-six cases that are showing their first symptoms since admission into this institution. None of these cases have ever shown any symptoms previous to these attacks.

Thirty-seven showed symptoms within six months of admission. Most of them showed symptoms on admission; I think I can safely say 75% of them. Seven had been here over two years before symptoms were detected; six over six months; five over one year; five over three years; two over five years; one over ten years; one over eight years; one over one and a half years; and one over four years.

We keep an accurate history of every case, and these are the first attacks of these sixty-six cases since their admission.

Conducted under the Editorial Direction of Dr. J. W. Walnwright.

**Dymal in Ulcus Cruris.**—The Wohlgemths (*Berlin Klinische Wochenschrift*, November 8, 1915) describes a plan of treatment for the above complaint of all grades with dymal. The lesion should be thoroughly cleansed with soaps and warm water and all dead tissue and crusts carefully removed; then be dusted thoroughly with the agent, blown into the pockets after they have been laid open. If lymph stasis is present or not the ulcer should in every case be covered with a light dressing and over this a firm elastic bandage of tricot from foot to knee. Dressings should be changed daily or less often depending on the secretion. Healing takes place promptly without the necessity of the patient having to remain in the bed or house. Dymal, the authors declare, is nonirritant, nontoxic, mildly antiseptic; stimulates granulations and is absorbed from the surface in twenty-four hours instead of forming a hard crust difficult of removal.

**Specific Therapy in Certain Acute Infectious Diseases.**—F. J. Dever, (*New York Medical Journal*, May 20, 1916) discusses the use of bacterial vaccines, sensitized vaccine and immune serums, and arrives at the following conclusions:

Since beneficial effects from the use of vaccines are obtained through the production of an active immunity, and since active immunity is developed relatively slowly, it is difficult to understand how their employment will be of advantage to the patient suffering from an acute infectious disease, even though sensitized vaccines are employed. Hope for the future seems to lie rather in the use of specific serum, which supplies the antibodies without calling upon the cells of the body to do additional work.

Experience in the treatment of typhoid fever and pneumonia does not justify their use, even though reports of harmful effects of such treatment are infrequent in literature.

The value of antimeningococcus serum is demonstrated so that the treatment with serum must be recognized as of the utmost value in epidemic cerebrospinal meningitis.

The subcutaneous or the intramuscular use of tetanus antitoxin therapeutically is of little or no value. The combined use of the intraspinal and intravenous injections has reduced the mortality and is therefore the method to be used at the present time. The serum treatment of pneumonia is still in the early investigative stage and not available for general use. Reports of investigations, however, are encouraging, and lead us to hope that in the near future serums will be available against the various groups of pneumococci.

**Prophylaxis of Tetanus.**—Kümmell, (*Berliner Klinische Wochenschrift*, April 17, 1916), reports making inquiries in various German hospitals as to the occurrence of tetanus during the eleven months in which the wounded have been given a prophylactic intramuscular injection of 20 units of tetanus antitoxin as a routine measure. In one hospital that had previously had numerous cases of tetanus, there had been but one out of seven hundred severely wounded, and he a man who had in some way failed to receive an injection. Among 1,555 seriously wounded, but one case of tetanus developed which proved fatal. During the period of eleven months but 42 cases had been known in the army notwithstanding the soil and weather conditions were the same as pre-

vailed during the previous year when the disease was so prevalent. Of the 42 cases but seven had received a prophylactic injection. The incubation period ranged from five to twelve days. Kummell declares that according to his reports, protection conferred by the antitoxin lasts for fifteen days only, while if the wound is very much soiled but a week's protection can be depended on. Therefore in the event that the wound was a foul one a second injection is necessary a week after the initial one providing any operative measures are contemplated. The author concludes that as for treatment, no dependable one has been found up to date which offers hope of cure when once tetanus has developed.

**Sodium Perborate in the Treatment of Wounds.**—Bourgeois, (*Progrès Médicale*, February 5, 1916) reports applying sodium perborate as a dry powder in the treatment of wounds. It becomes moistened by contact with the secretions and generates oxygen which acts like an ordinary solution of hydrogen dioxide, differing only in that it is alkaline. The author completely fills the wound cavity with powder, without draining, applies a flat dressing above, which is removed every day at first.

**Caution in the Use of Purgatives in Abdominal Pain with Abnormal Temperature.**—John Smyth (*The New Orleans Medical and Surgical Journal*, June, 1916), concludes his article as follows: The use of purgatives in obscure abdominal conditions should be avoided. They should never be given when abdominal pain is present, until such conditions as appendicitis, ileus, intussusception and ulcers have been excluded. Purgation is not only contraindicated, but unquestionably dangerous in acute appendicitis, except possibly at its immediate onset, and is directly opposed to the modern treatment.

**Ether in Peritoneal Infection.**—Saliba, (*Journal American Medical Association*, April 22, 1916), reports a series of 248 cases in which ether was used, one ounce in chil-

dren over four years of age and three ounces in adults, injected by means of a rubber drainage tube into the peritoneal cavity following abdominal operations, just before the last peritoneal stitch was tied. There were only three cases in which untoward results followed; there was no delay in recovery, and in only one case signs of an overdose of ether, Saliba believes that the ether has a decided germicidal action and thus shortens peritoneal infection.

**Epinephrine in Heart Block.**—Danulescu (*Presse Médicale*, February 17, 1916) reports experimental work in which he found that where incomplete dissociation of the auricular and ventricular beats exist epinephrine brings about almost entire disappearance of heart block with increase in heart rate. He concludes that to antagonize clinical manifestations of cerebral anemia which occur in attacks of heart block, we should resort to epinephrine rather than to atropine, the former exerting far more marked and prompt accelerating action on the ventricles than the latter.

**Tethelin.**—This substance is isolated from the anterior lobes of ox pituitary, reports Robertson in *Journal American Medical Association* (April 1, 1916). When given animals was found to retard early growth, and to markedly accelerate postadolescent growth. Animals receiving tethelin were smaller but heavier than normal controls. When animals were deprived of food for a time, and then given unlimited quantity with tethelin added, regained weight more rapidly than did controls. This agent apparently had a favorable influence in healing local wounds, and increasing the growth of tissue. It may be given internally or hypodermically.

**Optochin in the Treatment of Gonorrhea.**—Levy, (*Berliner Klinische Wochenschrift*, Oct. 18, 1915) records results in twenty-five cases in which this agent was used. He used injections of a one per cent solution and secured rapid disappearance of the gonococcus with relief of pain. Acute forms gave less

favorable results than subacute. In a small number of the cases treated with optochin instillations of protargol were required to remove the infection.

**Thymol-Benzene in Bilharziosis.**—Robertson, (*London Lancet*, March 25, 1916) reports favorable results from the giving of a solution of thymol in benzene. He dissolved two grains of thymol in half a dram of benzene. The author declares that by the third day of treatment ova were found in great numbers with the aid of the microscope; that subjective symptoms began to disappear, sleep return, pain diminish, vertigo cease, anemia improve, weight and strength were in evidence, and the urine soon became normal.

**Alcoholic Solution of Camphor in Erysipelas.**—Taboada, (*Chromca Medica*, March, 1916), declares that he has treated sixty-four cases of smallpox by using a ten per cent solution of camphor in a ninety per cent of alcohol, as a local application several times daily, followed by painting with a mixture of one part iodine and glycerine two parts. Warm baths with lysol solution were given daily. The camphor acted as a pronounced antiseptic and neutralized the fetid odor accompanying the disease. The author's mortality was 12.5 per cent as against 21.0 per cent by other methods.

**Quinine and Phenol in the Treatment of Rabies.**—Fielder, (*Journal American Medical Association*, April 22, 1916) declares that after reading a report of a case of rabies successfully treated with quinine and urea hydrochloride, he tried it in the case of a child who had been irregularly treated by the Pasteur method and developed typical symptoms of rabies. The quinine and urea had no apparent effect while necropsy showed Negri bodies in the brain substance. Four other cases were treated by either intravenous or subcutaneous injections of quinine and phenol, but all were unaffected by the remedies. Fielder therefore concludes that the case reported as rabies and cured

was probably not one of rabies and that the drugs mentioned have no specific effect on rabies.

**Antimenigitis Serum in Meningococcic Affections.**—Nevèn-Lemaire (*Bulletin de L'Académie de Médecine*, April 18, 1916) reports a series of sixty-four cases of acute meningitis treated in a military hospital at Dunkirk, France; fifty-four of which were of meningococcic origin, two typhoid, one each, parameningococcic, pneumococcic and streptococcic. Five cases were due to other organisms. All of the non-meningococcic cases, excepting one typhoid, ended fatally. Of the meningococcic cases, fifty-four in number, there were seven deaths, 12.96 per cent. There were of the series four protracted ones; complications noted in twenty per cent including the protracted ones, and localized paralyses, generally of short duration; sensory disturbances, persistent headaches, mental disorders, and involvements of the eyes, ears, joints, and in one case a meningococcic septicemia. The ages of patients ranged mostly under twenty-five years and between thirty-six and forty years. The mortality being much greater in the last mentioned. The disease was most prevalent in the months of March, April, May and June.

The author advises beginning spinal injections of antimeningitis serum as early as possible, using forty to fifty cc. at the first, repeating several times a day at first, especially if grave forms of the disease become manifest. He also declares that the injections are best discontinued when there is evidence of general systemic improvement: lowered temperature, condition of the cerebrospinal fluid, not by the disappearance of rigidity of the neck as this may persist for sometime; continuance of the use of the serum might influence the risk of serum intoxication. When relapses occurred the author took the usual precautions against anaphylaxis when resuming serum treatment after having discontinued its use for a week or more. He advises hot baths at 102° to 104° F. (39° to 40° C.) as an adjunct measure of relief.

In the author's last series of thirty-three cases, the mortality from meningococcic cerebrospinal meningitis was reduced to one case, or 3.1 per cent.

**Adrenal Therapy in Acute Intestinal Disorders.**—Strasburger considers the rational treatment of several types of acute diarrheal affection (*Med. Klinik*, Oct. 17, 1915) including acute indigestion, typhoid fever, dysentery and acute febrile conditions simulating influenza or paratyphoid fever in which intestinal symptoms were prominent. Large doses of bolus alba were commonly given, the author recommending as much as six ounces at one dose. He also speaks very favorably of the oral administration of epinephrine (adrenalin) and of its value in colonic irrigations. It was noticed that cases with mucus or mucus and blood in the stools responded better to this treatment than those with simple diarrhea. The action of the epinephrine seemed to be more than local and its direct effect not only antagonized the inflammatory process but inhibited the secretion of mucus. It was especially remarked that the subcutaneous administration of this drug was much less effectual than either of the methods previously mentioned, thus adding additional evidence to that already collected in this department to show that adrenalin and similar preparations can be given profitably per os.

He speaks favorably of the suggestion of Klein to inject 0.0001 to 0.0005 gm. of adrenalin hypodermically to neutralize an abnormally increased ovarian secretion in the blood. Apropos of this suggestion it is well to remember that there seems to be a fairly well established physiological antagonism between the ovaries and the adrenal medulla, just as there is between the ovaries and the mammary glands. Adrenal therapy is, therefore, of prospective utility in ovarian excess or the so-called ovarian dyshormonism; while this condition may easily unduly stimulate the chromaffin system and cause an adrenal insufficiency which may have quite serious consequences.

**Intranasal Adrenalin Treatment for Dysmenorrhea.**—In the course of a comprehensive consideration of the treatment of dysmenorrhea, F. B. Block (*Amer. Jour. Obs.*, Dec., 1915) states that in inhibiting ovarian hyperactivity he has had success with a modification of the intranasal treatment suggested by Fleiss. Instead of applying trichloracetic acid or cocaine, Block applied a 1:1000 adrenalin solution to the so-called "intranasal genital spots" and kept the solution in contact with the mucosa until it was thoroughly blanched, or about three minutes.

**The Treatment of Progressive Obesity.**—It was recently suggested that a few remarks upon the organotherapeutic treatment of obesity might be helpful, though this subject has already received passing attention in this department.<sup>1</sup> There can be no doubt that organotherapy is a most effectual adjuvant to the hygienic and dietetic treatment of certain forms of obesity. In two distinct forms of obesity organotherapy is the only prospectively helpful measure as in one form the obesity is due solely to a diminution in the activity of the thyroid gland with a resultant reduction in oxidation and elimination which is only successfully treated by stimulating the lagging thyroid gland, while in the other, the so-called Froehlich's dystrophy (*dystrophia adiposo-genitalis*) the pituitary gland is principally at fault.

<sup>1</sup>See especially "Some Points on the Administration of Thyroid Extract," AMERICAN MEDICINE, Sept., 1915, p. 715; "Points in Weight Reduction," Nov., 1915, p. 850; and "Some Points on Dyspituitarism," Mar., 1916, p. 192.

There are numerous reports in the literature on the successful reduction of superfluous adeps following the administration of thyroid or pituitary glands or both; but the writer is by no means convinced that it is good policy to attempt to treat obesity as a disorder *per se*. After all it is really a symptom of a more or less serious metabolic derangement, and after a careful study of the associated symptoms one can with propriety augment the obvious therapeutic measures with suitable organotherapy.

In those cases in which there is a thyroid insufficiency, one would expect to find associated with the obesity other manifestations of hypothyroidism as puffiness of the skin, especially on the face and hands; a dry, rough skin with badly nourished and brittle nails; falling hair with a frequent loss of the outer third of the eyebrows; mental dullness with a more or less well-marked loss of memory, sensations of cold, chilliness, chills and a seeming need for additional clothes and bed coverings. Hypothermia is common and metabolism is poor with a low urea content in the urine and reduced elimination through all channels. In such cases dietetic control accomplished little, but thyroid medication, from one to three grains per day in divided doses, often accomplished miracles. At one time five grains of thyroid was a standard dose and as much as fifteen or twenty grains was given daily and not a few obese patients were permanently harmed by the undue stimulation and their usual symptoms were changed into irritability, tremor, tachycardia and other evidences of thyroidism.

Many times a pituitary disorder may be associated with the thyroid insufficiency or, as has been previously mentioned, the pituitary may be chiefly at fault. In such cases one may be able to find such other symptoms of hypopituitarism as amenorrhea, hypotension, reduced body temperature, increased tolerance for sugar, as well as possible manifestations of infantilism and local manifestations or neighborhood symptoms of well marked pituitary disease.

In such cases pituitary feeding may be very effective, and the writer prefers the total gland substance in doses of  $\frac{1}{2}$  to 2 grains three or more times a day. The addition of a small dose of thyroid to each dose, say  $\frac{1}{4}$  grain, often renders this form of medication much more satisfactory. It

may be remarked in passing that several French writers who have recommended pituitary medication, have noted that when this treatment is continued for some time the heart action is strengthened, insomnia is lessened and the asthenia not uncommon in cases of this character, is considerably diminished while the elimination and oxidation is favorably affected as seen by the reduced weight and increased urinary solids.

It should be remembered also that some women become unduly obese when the activities of the ovaries are reduced, normally or otherwise. Obesity not uncommonly is associated with the menopause. In such cases thyroid therapy is often very helpful, especially if it is combined with corpus luteum or total ovary substance.

In any event, in all cases of obesity whether endogenous or exogenous, the metabolism should be thoroughly studied and the dietetic management should be carried out with care. The substitution of vegetables for animal proteids and the use of more fruits and less cereals is practically always in order.

**Adrenalin for the Treatment and Prophylaxis of Anaphylaxis.**—Parhon in a paper read before the Société de Biologie of Paris (*Presse Médicale*, June 15, 1916, p. 269) directed attention to the utility of injections of adrenalin solution in the treatment of anaphylactic accidents. Some of his experiences were very encouraging. Not only will such injections cause distinct benefit to the symptoms of anaphylaxis, but this same treatment is profitable as a preventive measure under circumstances where such accidents are to be feared.

This should be of considerable interest as with the advances in blood transfusion, and the use of protein bearing injections from which anaphylaxis is possible, there should be a widening field of usefulness for this new use for a well tried remedy.

**Ovarian Extract for Galactorrhea.**—In a summary of the study of the internal secretions and their bearing upon gynecological practice read before the Frankfort Main Medical Association (*Berl. klin. Wochenschr.*, Aug. 2, 1915) Cohn made in-

cidental reference to a phase of organotherapy that has not received very much attention.

After calling attention to the antagonisms which exist between the mammary glands and the ovaries, Cohn reports the successful use of ovarian medication in overactivity of the breasts. Good results followed this treatment of galactorrhea, and other similar conditions in which such treatment might be used will suggest themselves.

The usual dose of ovarian extract is from 5 to 10 grains three or four times a day, and it is best administered an hour or so before meals and at bedtime.

It was marked that pituitrin acted much more promptly and efficiently in this class of cases than any other drug at present available. If such injections could not be given conveniently, then the dried extract of the posterior lobe (infundibulum) or of the whole pituitary gland might be given for long periods with satisfactory results. In addition to the local pelvic effect, total pituitary therapy was found to be "a splendid tonic in some cases of asthenia."

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**Pituitary Extract in the Treatment of Menorrhagia.**—In a paper read before the Medical Society of the County of New York, S. W. Bandler (*Medical Record*, Feb. 12, 1916, p. 300) told of the value of posterior pituitary preparations in the control of functional uterine hemorrhages. He recommends this measure (hypodermic injections of 1 mil. of pituitary) every day for many days after abortion as well as after curettage for menorrhagia or metrorrhagia. Sometimes less than one mil. per day sufficed, the dose being regulated to the individual cases.

The contractions of the uterus following such injections at times were quite marked, whereas in others they were slow. Bandler emphasizes the value of hypodermic injections of pituitary extract as an excellent and convenient ambulatory treatment of uterine hemorrhages in young girls where examination, treatment or curettage were not possible. In such cases an injection of one mil. or less might be given every day for weeks or even months. Occasionally a patient will be unduly sensitive to such medication and in such cases the treatment is continued with much reduced doses.

A series of 33 cases of uterine hemorrhage was treated in this manner by Dr. Boldt of New York, and this included uterine fibrosis, fibroids, hyperplastic endometrium, subinvolution, retroversion, salpingo-oophoritis and posterior parametritis. From ten to thirty injections were given in each case, one mil. being injected every other day. There was little reaction and the results were stated to be "immediate."

**Adrenalin in Incomplete Auriculo-ventricular Dissociation.**—Two Roumanian physicians, Danielopolu and Danilescu of Bucharest, (*Presse Médicale*, Feb. 17, 1916, p. 80) report the results of a number of clinical experiments and laboratory studies of auriculo-ventricular dissociation. They find that injections of adrenalin cause three distinct clinical changes: (1) A considerable acceleration in the auricular and ventricular rhythm; (2) an almost complete disappearance of the dissociation and (3) extra-systoles of differing character. In the treatment of the phenomena of cerebral anemia, with or without dissociation, atropin is useful, but adrenalin is much better because the accelerating action upon the ventricle is more decided and more rapid.

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**The Control of "Salvarsan Accidents" by Adrenalin.**—There are frequent reports of severe reactions following the use of salvarsan or neo-salvarsan, these mentioning a wide range of symptoms in which collapse, paleness and clammy skin, heart irritability and, in fine, symptoms of acute arsenic poisoning are present. It is not possible always to anticipate these unfortunate outcomes, but Sauphar (*Bull. Soc. méd. d. Hopitaux*, Paris, Dec., 1915, p. 1,276) reports having used adrenalin in such cases with encouraging results.

He gave a single dose of neo-salvarsan in the usual manner to an individual who shortly after began to sneeze violently and whose conjunctiva became congested and profuse lacrimation was present. Following a second injection, a week later, there was much motor irritability, severe headache and complete insomnia. The temper-

ature went up to over 104 degrees, the patient was unconscious, his face was puffy and the muscles generally relaxed. There was also vomiting and stertorous breathing. This seems to have been a case of what has been named "salvarsan serous apoplexy," following which the patient becomes comatose two or even more days after the injection, and with no other symptoms dies in a few hours, while the autopsy reveals nothing save a congestive edema of the brain.

In such cases from one to five milligrams of adrenalin chloride (corresponding approximately to 15 to 60 minims of the 1:1,000 solution)<sup>1</sup> produces such intense vaso-constriction that the serous condition in the brain is prevented. In any event Sauphar, Milian and others are convinced that this is a rational measure and in the case just reported there seems to be no doubt that the outcome would have been fatal had it not been for the prompt effects of the injection of adrenalin.

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**Differentiating True and False Labor Pains with Pituitrin.**—Bandler reports as a "great find" a new use for pituitrin. In his article reported in the *Medical Record*, (Feb. 12, 1916, p. 300) he states that he is able to differentiate between the true and false labor pains by simply injecting pituitrin, thus disposing of the obstetrician's doubts as to whether a patient is in labor or not. This remedy has no effect in bringing on labor; but as soon as labor is well started, whether recognized or not, the action of the drug is most remarkable.

If the woman is in labor, three hypodermic injections of one-half a mil. or less, would produce regular, rhythmical and continued pains; while, on the other hand, if the patient is not in labor a slight pain might be produced in a short time, but this would not recur. Bandler also draws attention to the use of pituitary extract as an excellent means for the induction of labor. If a Barnes' bag was introduced

<sup>1</sup>An ounce of this solution (30 mils.) contains 30 mgms. of the actual drug, for 1,000 mils. contain 1 gram, i. e. 1:1,000; therefore on the basis of 480 minims to the ounce, each milligram of actual adrenalin chloride is represented in 16 minims of the standard solution.

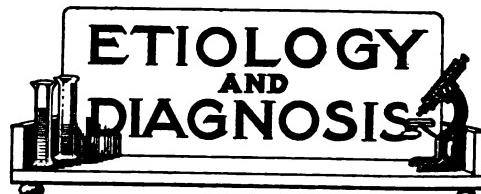
into the cervix, a few hours later the patient would notice a sensation of pressure and discomfort. If pituitary extract was then given in small doses and repeated, labor pains will be initiated and labor progresses without difficulty.

Such new and somewhat revolutionary uses for pituitary extract are bound to cause questions, but it seems that we are not to be bound down to the use of this remedy in 1 mil. doses only after the os is fully dilated. Great care and good judgment must be used, however, and after some experience no doubt these indications for the use of pituitary can be followed with much advantage.

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**Adrenalin by Mouth as an Analgesic.**—There has always been considerable controversy as to the giving of adrenalin by mouth. The matter has been referred to several times in this department and evidence has been brought to show that this remedy may be effectively used *per os*.

Further confirmation of this is found in a short note by Boogher (*New York Medical Journal*, July 8, 1916, p. 94) who relates his personal experience with 15 minim doses of adrenalin as an analgesic. He took this dose in a tablespoon of water as often as required for the control of the severe pain of an abscess of the transverse colon. Boogher considers this "a panacea in all cases of abdominal pain." He has since recommended this same procedure for the control of the pain due to gall-stone colic and renal colic "in both of which cases it gave splendid relief."



**Obscure Cause of Lead Poisoning.**—Groat, in a paper read before the Syracuse (N. Y.) Academy of Medicine, reports a case of lead poisoning from a peculiar cause. The patient, a worker in metal, had previously been poisoned by handling sheet lead. He made a fair recovery and then went to work on steel and steel alloy alone. Symptoms of lead poisoning again

occurred. No source was apparent. After going over the matter a number of times the patient recalled that defective parts of machines given him to rectify had been marked with paint. The paint, of course, never got very firm, and off the top of the pile it might be quite green. In fact, he recalled that his hands were frequently discolored by paint. While this ordinarily would not cause lead poisoning in many cases, says the author, yet in a man already sensitive to lead, it is more than sufficient to act.

**Albuminuria Following Administration of Hexamethylenamine.**—O. Leyton (*Lancet*, July 22, 1916).—A man thirty-nine years old was first seen nine years ago and, although then in apparently perfect health, his urine was found to contain granular casts and red blood cells, and to boil solid with albumin. The albumin consisted of serum albumin and serum globulin. Careful examination failed to reveal any evidence of renal disease or cardiac involvement, but it was found that he had been taking large amounts of hexamethylenamine and it was thought that the liberation of formaldehyde might have produced a permanent damage to the kidneys. The drug was being taken to relieve a colon bacilluria. He was seen again recently, nine years after his first visit, and the conditions were found to be about the same as before and his health and strength were apparently still quite normal. The only change was the development of very slight evidences of some myocardial impairment. Following the second examination he underwent a surgical operation, from which he recovered normally.

**The Virus of Poliomyelitis.**—“The virus of poliomyelitis enters the body, as a rule if not exclusively, by way of the mucous membrane of the nose and throat,” says Flexner (*Jour. A. M. A.*, July 22, 1916). “Having gained entrance to those easily accessible parts of the body, multiplication of the virus occurs there, after which it penetrates to the brain and spinal cord by way of the lymphatic channels which connect the upper nasal mucous membranes with the interior of the skull. Whether the virus ever enters the body in any other way is unknown.

The physical properties of the virus of infantile paralysis adapt it well for conveyance to the nose and throat. Being contained in their secretions, it is readily distributed by coughing, sneezing, kissing, and by means of fingers and articles contaminated with these secretions, as well as with the intestinal discharges. Moreover, as the virus is thrown off from the body mingled with the secretions, it withstands for a long time even the highest summer temperatures, complete drying, and even the action of weak chemicals, such as glycerin and phenol (carbolic acid), which destroys ordinary bacteria. Hence mere drying of the secretions is no protection; on the contrary, as the dried secretions may be converted into dust which is breathed into the nose and

throat, they become a potential source of infection. The survival of the virus in the secretions is favored by weak daylight and darkness, and hindered by bright daylight and sunshine. It is readily destroyed by exposure to sunlight.”



**Heart Disease.**—White, in the *Boston Med. and Surg. Jour.*, reaches these conclusions:

1. The male sex has been found to be more subject to auricular fibrillation, auricular flutter, heart block and alternation of the pulse than has the female sex.
2. The older the patient with heart disease the more subject he has been found to be to serious abnormalities of the heart-beat.
3. Auricular fibrillation and alternation of the pulse occur at the same ages, and most frequently in the fifth and sixth decades.
4. Rheumatic hearts usually show normal mechanism or auricular fibrillation, much less commonly pulsus alternans.
5. A considerable percentage (36 per cent) of syphilitic hearts showed alternation of the pulse; few were fibrillating.
6. A patient with cardiac insufficiency in the course of cardiorectal disease was very apt to show pulsus alternans, either constant or more frequently only after ventricular premature beats.
7. Cardiosclerosis often resulted in the production of fibrillation and alternation.
8. Hyperthyroidism of long standing was sometimes attended by auricular fibrillation.
9. Alcohol, tobacco, tea and coffee appeared to play no direct part in the production of serious disorders of the heart-beat.
10. Two-thirds of the patients with auricular fibrillation, one-half of those with alternation of the pulse, and one-third of those with normal mechanism in the present series showed physical signs of cardiac insufficiency.
11. Digitalis was used in 88 per cent of these decompensated cases, almost always in the form of pills of standardized leaves. Intravenous medication was used in urgent cases only.
12. Morphia was given beneficially in nearly one-half of the patients with physical signs of insufficiency, often one dose sufficing to give the patient the first comfortable night in weeks.
13. Venesection was found useful in a few urgent cases.
14. The change in diet to five small meals daily was often much appreciated by the patient.

**Treatment of Carcinoma of the Breast.**—Pfahler (*Inter. Med. Jour.*) concludes as follows:

1. There is a tendency to recurrence and metastases of carcinoma of the breast in at least 20 to 25 per cent. of the cases, even with the earliest operations, and in those in which there has been glandular involvement there is a recurrence in at least 75 per cent. of the cases. Therefore, it is our duty to use every means at our command that gives promise of an increase in the number of cures.

2. Since definite recurrences and metastases, following carcinoma of the breast, can be made to disappear by means of roentgenotherapy, it is reasonable to expect the disease to disappear at an earlier stage immediately after operation, when only a few isolated cells or a beginning infected gland remains.

3. Efficient and thorough treatment in the early cases will probably increase the percentage of ultimate recovery from 75 to nearly 100 per cent.

4. Thorough massive dose treatment by cross-firing methods may be expected to accomplish more than has been previously accomplished by the older methods.

5. Patients should be kept under observation for several years, and at the earliest sign of recurrence they should be subjected to a thorough course of deep roentgenotherapy.

**Carbolic Acid Injections in Hemorrhoids.**—Morley in the *Lancet*, (Mar. 18, 1916) strongly recommends the injection method instead of the usual operative treatment. The advantages are many and obvious: it relieves the pressure on the beds in hospital; the patient need not lie up for more than 24 hours, and less than that if necessary; there is no need for general nor even local anesthesia; the treatment is painless; any hemorrhage that there has been soon stops. The method is inexpensive and safe, and is especially applicable to pregnant women, the aged, and those who for some reason or other cannot take a general anesthetic. It is suitable in cases of heart or lung disease, there is no after-pain, and relief of pain can be promised for three years; recurrences have to be reckoned with, but they can always be met by re-injections, the patients preferring this to an operation. The author does not recommend the procedure for strangulated or irreducible hemorrhoids, and the same advice holds for complicated cases, whether with tumor, fistula, fissures, or ulcers; also for polypoidal or fibrous hemorrhoids, especially if associated with chronic constipation.

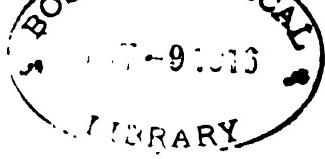
The author injects a 20 per cent. solution of carbolic acid in glycerin and water, equal parts. Two to six minims should be injected into each pile; more than this is apt to cause sloughing and pain. A. Kelley's sphincteroscope is used, being well greased before insertion, passed up gently, and then withdrawn slightly; all the hemorrhoids within sight are injected, from below upwards. The syringe recommended is Dawson's dental syringe, fitted with a wide bore needle, 3-8 inch long and elbow-shaped socket. The patient should have an enema first, then should be placed in the knee-elbow position or

on the left side, with a sandbag under the hip. The pile should be touched with a spot of pure carbolic to sterilize it, and the needle entered above the anal valves. The after-treatment consists in giving a mild laxative such as senna or sulphur.

**Artificially Induced Fever Temperature in Treatment of Gonorrhea.**—As the gonococci are killed so easily by temperatures of only 42 C. (107.6 F.), attempts have often been made to sterilize the urethra by application of heat (*Munch. Wochenschrift*). But the constant influx of blood keeps the temperature below the required degree of heat, and all such attempts have proved futile to date. Weiss solves the problem in another way, by keeping the patient in a hot bath until the entire body is heated to the required fever temperature. In eleven cases of recent gonorrhea he had the men take a hot bath forty or fifty-five minutes long, with the temperature of the water gradually increased from 40 to 43.5 C. (104.5 to 110.5 F.). In one case the body temperature was raised to 42.6 C. (108.5 F.) in a forty-minute bath, and the gonococci disappeared entirely at once. In the other cases the body temperature did not go so high, but the vitality of the gonococci was evidently reduced and under a few local injections they soon all disappeared.

**Transfusion in Scarlatina.**—Zingher, in the *N. Y. State Jour. of Med.*, recommends immediate injection of freshly drawn whole blood, or of blood to which sodium citrate has been added in the proportion of one c.c. of a ten per cent. solution for each ounce. The injections should be multiple and intramuscular, a syringeful (one ounce) being injected into the gluteals, external thigh muscles, calves, and the triceps. Four ounces can readily be given to a young child in this way and twice this amount to an older child or an adult. Usually the absorption of the blood is rapid, although it clots in the muscles. Zingher summarizes the effects as follows: Within two to four hours the temperature declines and reaches its lowest level in nine to fourteen hours; the impulse becomes stronger; cyanosis and cardiac symptoms improve; respiration becomes normal; the rash fades, and the general condition of the patient shows marked betterment. Secondary septic complications are not appreciably affected.

**Calcium Chloride in Erysipelas.**—Kawakami (*Set-I-Kai Med. Jour.*, April 10, 1914), reports thirty cases of erysipelas treated by injection of five to twelve drachms (20 to 50 c.c.) of a one per cent. solution of calcium chloride. After the injection the patient generally has a sense of warmth; in rare instances temporary palpitation. At times there were sweating, thirst, fever, and general weakness for a few hours. The local condition markedly improved, or at least the progress of the disease became slower, and a tendency to speedy recovery was noted.



# American Medicine

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**Poliomyelitis and the Schools.**—The personal contact theory of the dissemination of poliomyelitis is rapidly losing ground. The small number of secondary cases found in the New York epidemic presents a great puzzle to those most sincere in their belief that contact with acute cases is the main factor in its spread.

During 1910 in Boston, there were 35 cases of infantile paralysis among children attending school, but 22 of them arose in different schools. Of the 227 cases reported in New York State in 1910, 39 were in children attending school at the time of the onset of the disease but there was only one victim in each of 26 schools. In some of the instances where more than one case appeared in a particular school the interval between their development varied from 11 days to 4 months. In Buffalo in 1912, of the 84 cases occurring after the opening of school, only 29 per cent. were in children attending schools and no secondary cases were noted.

The fact that the mortality of infantile paralysis appears to be as great, if not greater, in rural or sparsely populated sections of the country strongly suggests that congestion of population plays little part in the distribution of the disease. There have been more cases in proportion to population, for example, in the Borough of Richmond than in the congested Manhattan Borough. In several instances, single cases of the

disease broke out in orphan asylums without the development of any secondary cases.

During practically the entire summer, while the New York epidemic was raging, there were 117 public schools in session, together with afternoon playgrounds, of which advantage was taken by 78,000 children. As far as the educational reports are concerned, no case of infantile paralysis among this group of children is known to have occurred. The percentage of infected children going to the milk stations of the city was exceedingly low.

Simon Flexner has already called attention to the fact that "the degree of susceptibility of children and other members of the community to infantile paralysis is relatively small and is definitely lower than such communicable diseases as measles, scarlet fever, and diphtheria."

**From the standpoint of the schools,** it is recognized that practically three-quarters of the children affected with infantile paralysis are under the school age. Of the deaths recorded for the first seven months of 1916 in New York City, only 2.7 per cent. were in children over 10 years of age, while 83 per cent. were under 5 years of age.

It is quite possible that before the epidemic wholly subsides occasional cases will be reported among children attending school. This, however, should not occasion unusual anxiety. Such occasional visitations may

be controlled satisfactorily by methods at present instituted, although in the absence of more complete knowledge with reference to the direct or indirect carriers of the virus a "scientifically adequate method of control is impossible at the present time."

In Harrington's Practical Hygiene as revised by Richardson is found the significant statement: "The occurrence of a single case in a school need not cause special anxiety, several such instances having passed under the writer's observation, with the occurrence of no secondary cases, although large numbers of children had been exposed to infection in what was supposed to have been the most contagious stage of the disease."

**When the epidemic will have passed into history,** the disease will still remain as a more or less constant agent in the mortality of New York City, just as it has been more or less constantly present during the past ten years. It is unfortunate to continue further the feeling of anxiety and it is to be hoped that exaggerated and ill-founded fears will be allowed to die with the epidemic. To focus public attention, especially, upon the possibility of school infection as it relates to infantile paralysis is manifestly unwise. If it is safe to open schools particular attention should not be devoted to a potential plague that is smoldering in the community. The danger of infection at school with poliomyelitis is far less than the hazards from any of the other diseases of childhood.

The main point to be emphasized is the value and importance of personal hygiene, home hygiene, and civic hygiene, but these appertain to the protection of the individual and the community from all forms of communicable and contagious diseases. Let

the schools carry on their educational work unhampered by unnecessary and groundless fears which themselves are destructive of mental power and physical energy. The health departments must be the arbiters in matters pertaining to the health of school children, in so far as communicable diseases are concerned. Upon them rests the responsibility. While health departments demand the recognition of their rights by educational authorities, they too must take cognizance of the educational aspects of some of their rules and regulations, lest through inconsistency, over publicity, and faulty judgment their advice be considered that of the alarmist, which is finally ignored as being too extreme to be reasonable.

A study of the weird, injudicious, and oftentimes scientifically unsound methods of quarantine that have been employed in many communities during the summer appears to indicate that the laymen, in many villages, towns, and cities, are weighing the evidence, studying the results, and then questioning the rulings of the established authorities, empowered and consecrated to health protection. Confidence in the judgment of the health officer, however, is the very foundation of public health work.

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**Physical Training.**—The schools of the country are again open for their season's work. It is but natural that the dying epidemic should convey a last message to school officials. While it is probably true that schools play a very little part in the dissemination of poliomyelitis, the impetus to health work that this disease has left behind should find invaluable practical results in educational circles. The attention that hy-

giene warrants in a school system demands that the welfare of school children should consist of more than mere physical training, more than the development of hard muscles, but should include the acquisition of knowledge as to how to live.

The instruction of teachers in hygiene is so limited in the normal and training schools of this country, that they have produced a generation of teachers inadequately trained for teaching hygiene or for imparting education in a most hygienic way. There should be a distinct awakening to a recognition of the importance of conserving child life through education. It is necessary to prepare the present school children through adequate instruction to fit them for active participation in civic life. They must realize their reasons for demanding the civic hygiene so essential for municipal health.

A strong indication of the new attitude towards hygiene is found in the report of the Military Training Commission of New York State as accepted by the State Regents. A preparation for elementary military training is interpreted as involving physical training which is to cover medical inspection, talks and recitations in hygiene, physical exercise, gymnastics, supervised recreation, organized play and athletics. New educational values are thus developed. The manual of arms and drill regulations become subordinated to the main essence of rational military systems which require and demand the development of soldiers intelligent, resourceful, vigorous, and wise in the knowledge of the worth of personal and military hygiene.

**Educational hygiene** has too long been confined to a consideration of the physical

environment of the school. The important problems relating to school management, the health of the teacher, the hygiene of methods and the physical constitution of the pupils have been seriously neglected in this country. The entire movement may be said to be less than twenty years old, although medical inspection of schools was instituted in Boston in 1895.

From the standpoint of preventive medicine, no movement is fraught with greater significance than this general realization of the importance of maintaining health and of conserving the potential resources latent in the school population. The hearty support of the medical profession is naturally given to educational matters pertaining to the public health. To this new point of view will be accorded the most active sympathy and support, not merely of health officers and sanitarians but of the rank and file of the profession interested in conquering disease and in preventing physical defects and disorders hampering the full development of the children and workers of the nation.

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**Nationalized Medical Practice.**—On October 16, 1916, the National Board of Medical Examiners will hold its first examination at Washington. The purpose of the National Board of Medical Examiners is to establish a system of certification of graduates in medicine which in the course of time will be accepted in lieu of state examinations by state boards of medical examiners.

The present educational basis demanded of applicants includes two years of college work, graduation from a medical school of Class A, and one year of internship in a

hospital or laboratory of good standing. Unfortunately, candidates at present applying will merely receive certificates indicative of their medical knowledge and ability. They will not have any advantage in State Board examinations, nor at the present time will the certificates be recognized by any state as a *de facto* licensure.

As an educational procedure, this course of action represents a desirable step in advance. Standards for medical practice should be equally high throughout the states of the Union. The question of state reciprocity of medical practice is one which is contrary to the actual needs of the public. There should be no question of reciprocity. A graduate in medicine capable of practicing in New York State should be equally able in Louisiana, California, or Minnesota. The present variation in State Board requirements is a blot upon our methods of determining qualified practitioners. It is sincerely to be hoped and expected that the work of the National Board of Medical Examiners of the United States will be recognized as practicable and will succeed in convincing the state authorities that its certification should satisfy all the requirements of any state.

It is undoubtedly only a matter of time when the principle involved will be accepted as correct and then it may be possible to have in every state the uniform examinations held under the auspices of the National Board of Medical Examiners. They shall no longer create invalid and unwholesome distinctions between practitioners in medicine. There will no longer be New York State physicians or Illinois physicians, but United States practitioners, whose field of activity will range from coast to coast and whose credentials will bear the stamp of approval of a national examining board.

**Pensioning Medical Professors.**—The modernizing of medical schools by the establishment of full time professorships brings in its train many of the problems belonging to educational institutions of the academic type. During the course of 15 or 20 years, there will be developed sundry problems relating to superannuated professors or teachers disabled as a result of accident and disease. For this reason, the problems involved in the pensioning of teachers should not be ignored. *Bulletin No. 9 of The Carnegie Foundation for the Advancement of Teaching presents "A Comprehensive Plan of Insurance and Annuities for College Teachers,"* by Henry S. Pritchett.

This valuable and suggestive discussion points out the merits of a prospective scheme to protect teachers against the life hazards incident to their calling at a cost that is not prohibitive. In so far as the plan requires a contributory system in which each individual teacher and the institution join, it is manifestly important that it be instituted while the members of the teaching staff still possess youth. Death, dependence in old age, and disabilities are the risks particularly hazardous for teachers because of their meagre salary schedules.

The **plan proposed** requires the cooperation of the college, the teacher, and the Carnegie Foundation and thus provides for the abolition of pensions as gratuities or charitable offerings. For social, moral, and economic reasons, it seeks to preserve the self-respect of the teacher while it protects him and enables him to fulfill his obligations and responsibilities for the safe provision for his family in event of his death or disability. By a system involving the purchase of term insurance for a definite period

*"Is it worth while for medical science to lower the mortality rate—to increase the number who reach adult life—if any day, any hour the avalanche of war is liable to sweep away all the lives that have been saved—and many more!"*

of time, ending at age 65, and by the payment of premiums on an old age annuity going into effect at that age, the costs are made minimal while the ultimate financial results are sufficient to afford ample protection at the time when an interrupted pedagogic career makes them necessary and welcome.

It is quite improbable that medical colleges unattached to general universities will give much thought or attention to this phase of their responsibility. Individual colleges cannot very well undertake a scheme of this character, as their teaching groups are too small to establish the plan on a sound financial basis. The obligation for the protection of the teachers, nevertheless, falls upon the colleges with strong force on moral, economic, and educational grounds. It is important, therefore, for medical colleges in introducing the full time professorships to properly value and tabulate their obligations to their teachers and to work out at the present time some plan for their future benefit.

The age best suited for a scheme involving term insurance is under 30 years and the premiums for old age annuities are naturally lower the younger the premium payer undertakes to work out his old age financial destiny. The colleges should feel the importance of their contribution to this end. As has been said with reference to workmen's compensation, the industry itself should bear the burdens of the disabilities for which it is responsible. Teaching in medical colleges as well as teaching in any institution represents a calling that must bear its share in safeguarding the financial welfare of those who give their strength, mind, and vitality to its betterment.

**Midwifery Problems.**—Repeatedly has attention been called to the importance of training in obstetrics. The Council on Medical Education recommends 180 hours on the roster for obstetrics exclusive of the time required for attendance on six labor cases. The Association of American Medical Colleges requires students to witness at least twelve cases and personally conduct three women through pregnancy, labor, and the puerperium under proper supervision. These standards are not remarkably high considering the importance of the subject.

The state standards of medical education and licensure are far from uniform. General criticisms are not published sufficiently to stimulate the State Board of Licensure to establish the types of requirements which are deemed adequate in the foreign lands. Barton Cooke Hirst (*American Journal of Obstetrics*, July, 1916) calls attention to the fact that the women of our country are afforded less protection than is considered necessary in other countries. He rightly lays emphasis on the duty of a board of licensure to protect child-bearing women from mutilation, disability, and death, due to incompetent medical attendance.

The inadequacies of our system of training in obstetrics have largely arisen through the antiquated system of establishing the curriculum on the basis of the hourly lecture. Medical pedagogics thus far have not reached the highest plane and until a proper evaluation of the subjects necessary for medical education is made, it is unlikely that there will be marked changes in the present system. In the meantime, obstetrical teaching must suffer and, as a result, society constantly faces an unnecessary hazard.

**Raising the Standard of Obstetrics.—**

Theoretically, the trained medical attendant is the proper one to assume the responsibility for safeguarding parturient women. The general experience of communities does not reflect the superiority of physicians to midwives in as definite a manner as one would expect. As a recent illustration of this, one finds in the annual report of the Bureau of Child Hygiene of Newark, New Jersey, for the year ending September 31, 1915, that the infant mortality under one month of children delivered by midwives is 24.1, delivered by physicians 27, and delivered in hospitals 50.1. It is patent that the hospitals receive the more difficult and protracted cases of labor and those with the most numerous complications. Their high mortality rate is therefore not surprising. Similarly, physicians probably attend more women in cases requiring surgical interference, and as a result, they are credited with greater mortality during the first weeks of infant life than is to be found among the children brought into the world under the auspices of midwives. The physicians, however, attended in homes only 38.87 per cent. of the total births. Midwives were responsible for 1,200 more births than the physicians during the year.

Considering this large service of midwives, it is but natural that the fact rather than the theory should be faced and steps taken to raise the standard of their practice. Since January, 1916, no midwife, in Newark, is permitted to practice without a license; and there are today in the City of Newark over 100 registered licensed midwives. There has been a systematic process of education going on under the direction of a supervisor who gives instruction to midwives in matters pertaining to personal

cleanliness, obstetrical technic, and the essential points from maternal nursing and infant care. There has been developed a sympathetic understanding between the teachers of infant hygiene, the nurses and the midwives, so that active cooperation exists with a view to protecting mothers and children.

**In the matter of reporting births,** splendid advance is noted in that only 29 unreported births were discovered among midwives, though they attended 5,414 births, and only 82 births were reported late, while among the doctors, though they attended only 4,243 births, 155 were reported later than the law required.

It is folly to regard the question of the midwife as unimportant and negligible. It is unwise merely to condemn and ignore them. They exist and at the present time it is practically impossible to legislate them out of existence. With the standards of medical obstetrics as low as they are, it is doubtful if the results would be much better if the midwives were suddenly eliminated and all obstetrical practice were to be placed in the hands of medical men. Midwives must be considered in the light of their potential capabilities and usefulness in and to various communities.

While obstetricians, throughout the country, are seeking to elevate their standards and to establish more rational methods of instruction than didactic lectures, it would seem to be part of wisdom to attack the midwife problem along similar lines. Should there be education, supervision, regulation, and licensure, then the ignorant, the vicious, and the septic types of midwives will gradually disappear. There will be fewer deaths of mothers, and a decreased mortality during

the first month of infant life. In addition, it must not be forgotten that by constantly pointing out the necessity of improving the standards of midwifery public opinion will become enlightened and medical institutions will slowly feel its force to such an extent that they will be in conscience bound to improve their own facilities and to foster a higher type of obstetrical attendants.

Focusing attention upon the importance of this subject will tend to awaken state boards of licensure to their duty and responsibility to the public. They too, after thought and compelling judgments, will establish higher preliminary qualifications for candidates in medicine in order to attain the licensure of individuals adequately trained for the performance of obstetrical work. The Association of American Medical Colleges and the American Medical Association, the American Hospital Association, and similar organizations of trained medical minds and medical educators should be the leaders in securing this much needed advance. It is discreditable to deem it necessary to create public opinion upon this subject when it is within the power of such organizations to secure the correction of the present defects through their own attention and efforts.

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**Hay Fever.**—What cannot be cured ought not to be endured. On this theory the American Hay Fever Prevention Association is securing the introduction of ordinances, with a view to penalizing tenants or occupants of leased or occupied premises, lots or other areas, or the owners of such when there is no subletting, for permitting weeds or grass to grow over one foot in height. In 1915, the New York City Department of Health placed an item in the

Sanitary Code restricting the wild growth of poison ivy, rag weed or other poisonous weeds which might trespass upon public places.

It is proper that every effort should be made to control the development of pollen bearing plants involved in the causation of hay fever. North America is unfortunately the most afflicted country with reference to this disease. While undoubtedly special individual predispositions to the disease occur, some exciting cause must exist to produce such unpleasant effects upon the individual thus predisposed. It is 85 years since the pollen theory of causality was announced. After the communications of Elliotson and Blackley, the general theory remained quiescent until Dunbar issued the results of his experiments. He demonstrated that pollen does not act as a purely mechanical irritant, but because of some toxic characteristic, probably an albumin. Kammann's studies established the fact that the pollen toxin is a toxalbumin.

At the present time there appears to be some promise for the hay fever sufferer in the explanation that some individuals possess a hypersusceptibility to the toxalbumins of various pollens. Recent investigations have indicated that the hypersusceptibility varies with individuals and in a sense partakes of the nature of an anaphylactic reaction. By determining, therefore, the sensitiveness of the individual to a large variety of pollens, it becomes possible in a reasonable proportion of cases to establish the exact pollen serving as the toxic agent for the particular individual. Specific treatment thus may be instituted with some hope of relief.

Thus far, experience has indicated splendid possibilities of palliation and in a small proportion of cases apparent relief for a few years. It is too early to decide whether

actual cures have been effected. The widespread use of the present therapy during this summer will undoubtedly reveal many shortcomings of the treatment, indicate some weaknesses in the theory, and what is most important, point out the line along which the next progressive steps are to be taken.

Regardless of the therapeutic results, it cannot be doubted that every possible step should be taken to prevent hay fever. Wherefore, ordinances and regulations for the control of plant life believed to be contributory to the development of the disease, merit approbation and imitation. The various factors responsible for the spread of diseases such as influenza require careful study in connection with other sanitary studies bearing on hay fever. Hard work, mental anxiety, deflected septa, hypertrophied turbinates, and large tonsils and adenoids are not to be disregarded simply because the present theory of hypersusceptibility appears to be of primary importance. Whatever physical conditions require correction should receive attention; whatever relief of mental disquiet or over-fatigue may be necessary should be afforded. In brief, the sufferer from hay fever should be placed in the best possible physical condition in order to strengthen his general resistance to disease, even though this may not suffice to ward off the customary attack to which he has nervously been looking forward as a definite consequence of living to an almost specific date in June, July, or August.

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**An Industrial Survey.**—The conditions existing in moderate sized industrial cities determine the degree of health in the community no more, no less than similar conditions in large metropolitan cities. For this reason, a survey of the industrial conditions

in Springfield, Illinois, probably typical of many of the cities in this country with populations between 25,000 and 150,000, is of particular value. (*Industrial Conditions in Springfield, Illinois*, Department of Surveys and Exhibits, Russell Sage Foundation).

The mere establishment of local ordinances or state laws is insufficient to secure satisfactory industrial conditions unless public opinion makes demands for and actually secures the enforcement of protective legislation. The industrial status, as was revealed by investigation, points out many significant forces that tend to undermine general health. The recommendations of Odencrantz and Potter are significant from the public health standpoint.

For the purpose of economic betterment and in order to serve as a powerful force for the prevention of accidents and disease, compulsory compensation acts for workmen and the establishment of a health insurance law are urged. Fire regulations and fire prevention work are urgently recommended. The child labor law has not been adequately enforced and children under 16 years of age are being employed for illegal hours and in prohibited employments.

**The relation between health and income** is now generally recognized and the wages of many unskilled workers in Springfield are too low to permit the earners thereof to maintain themselves properly or to permit men to support an average sized family. The reduced incomes are due in part to a large measure of seasonal and irregular employment which could be obviated in part by regulation of industrial establishment and through the development of a free municipal employment agency. Seven day

labor exists for a number of men and women and legislation to prevent this merits vigorous support. The general trend towards an 8 hour day, as a public health measure, is noticeable throughout the country and the urging of this for the State of Illinois is not radical advice but rational and desirable. In many instances, the standards for industry are not found to be abreast of modern ideas or adequate legislation suffers because of weak enforcement.

Industrial surveys of this character are distinctly valuable, not alone as a matter of public education but as affording a basis for intelligent constructive work to mitigate the dangerous elements in industrial life. The experience of health officers and sanitarians, as well as specialists in industrial hygiene indicates that many of the hazards of industry are not inherent in occupation but are preventable through wise but continuous attention to the improvement of industrial conditions.

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**Young Veal as a Food.**—Popular traditions with reference to the digestibility of food stuffs frequently interfere with the proper utilization of available commodities. It is not so many years ago since the tomato, then termed the "love apple," was regarded as unfit for human consumption. Scientific dietitians are constantly struggling to reveal the worth of foods interdicted because of a fear of their unwholesomeness.

In the *Journal of Agricultural Research* (July 17, 1916), Langworthy and Holmes demonstrate the unreasonableness of the current belief that very young veal is undigestible. While the sale of calves less than 3 to 6 weeks old is very generally prohibited by Federal and State laws, the rea-

son therefor is mainly due to economic interest in the development of cattle, though to some extent to custom and prejudice.

The common opinion that veal is inferior to beef as a food and that young veal is less serviceable than mature veal is not due to a consistent prejudice against young flesh. The popularity of the squab, the broiler, and the sucking pig, not to mention the hothouse lamb, attests the accepted palatability of young flesh foods without reference to economic problems. Opposition to the use of young veal has resulted from a belief that its digestibility is less than that of other meats or that it is likely to induce digestive disturbances, thus indicating it to be a harmful and unphysiological food stuff.

Chemical investigations have demonstrated that the difference between young veal and market veal is largely a question of an increased amount of water and slightly lower protein and fat content. This difference, however, disappears during the process of cooking, owing to the greater loss of water from the younger veal. The term "bob veal," as applied to young veal, creates misapprehension in the mind of a cautious purchasing public. Bob veal is defined as "the flesh of a newly born calf or of one taken out of a slaughtered cow; unfit for food." To characterize all young veal as bob veal is to cast suspicion and condemnation upon a flesh that according to recent investigators is suited for use of human food.

Langworthy and Holmes, after studying the coefficient of digestibility of very young veal (never more than 5 days old) came to the conclusion "that the general opinion that young veal is a common cause of digestive disturbances or fails to digest as thoroughly as similar foods is not justified." No phy-

siological disturbances were noted among the individuals or families tested. Inasmuch as young veal is very lean and consists principally of water and protein, the experiments on digestibility were limited to the study of the digestibility of the protein content. Compared with the digestibility of ordinary meat protein, the average value for young veal was found to be almost identical, namely 93 per cent. in round numbers.

While ordinary preparations of young veal present a less appetizing appearance than do the more mature meats, they serve as a satisfactory substitute for the common market veal, providing the fat deficiency is made up in the cooking process. The method of preparation determines the palatability, but its wholesomeness apparently is no less than that of more mature forms of veal.

The worthiness of young veal for human consumption having been determined, it becomes possible to safeguard the meat supply by the reclamation of the calves in regions where the dairy industry is highly developed and where calves are slaughtered during the first week of life instead of being retained and fed until of a lawful marketable age. Meat protein is our most expensive food product and the wastage of young veal is to be discountenanced now that its wholesomeness as a food has been determined. The laws prohibiting the sale of calves under 6 weeks of age appear to interfere with the full development of this meat supply, though a change in the legislation would undoubtedly require regulations protecting the young veal in preservation, transportation, and marketing. The economic problems involved in the slaughter of young calves present many questions but

we are concerned at this time only with the food value of veal.

It appears that another food tradition, which may have been of service in older days when cold storage plants did not exist on a commercial scale, has been overthrown. It will require many years, however, before this fact is generally accepted because food traditions consume time and patience before they are finally wiped out. In the meantime, the intelligent food purveyor and purchaser will banish their fears regarding the availability, safety and digestibility of young veal for human consumption.

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**Typhoid Carriers.**—Sawyer, in the *Journal of the American Medical Association*, June 19, 1915, in a communication on The History of a Typhoid Carrier, says in concluding that although frequent examination of the feces of this typhoid carrier gave negative results for four months after being treated with autogenous typhoid vaccine, he, nevertheless, infected three persons when subsequently released from quarantine on parole. The total number of persons infected by this carrier is thirty, five of whom died.

In a further attempt to cure this carrier, the gall-bladder and its duct were removed surgically, but the typhoid bacillus was found in his feces several times after the operation. Examination of the gall-bladder showed that it was normal and that its contents were free from typhoid bacilli. After forty-one successive examinations of feces during a period of fourteen months, all with negative results, the typhoid bacillus was isolated from stomach contents containing bile. Typhoid carriers are unusually dangerous and must be controlled by quarantine or other adequate supervision.

**Progress in the Use of Anesthetics.**—It is interesting to observe the remarkable progress that has recently been made in the study and application of both local and general anesthesia. It is only a few years ago that the administration of an anesthetic was considered the least important detail of an operation. A student, a nurse, any casual bystander was looked on as fully capable to attend to the anesthetic. "Any-one can give ether—or chloroform," seemed to be the sentiment generally held in respect to this detail of modern surgery—and all too often up to a very few years ago "anybody" was entrusted with this part of an operation that is now considered only second to the work of the operating surgeon himself, in its burden of grave responsibility. Looking back on experiences every operator has passed through—and not so long ago—the wonder will grow that catastrophes have occurred as rarely as they have. It is an old saying that Fate is kind to children and drunkards. Anesthetists up to a few years ago could have well been added to these whom a benign Fate is believed to exempt from the consequences of their own weaknesses or shortcomings, for if there ever has been a group of mortals whose acts, in the light of today's knowledge, would seem to have offered a standing invitation to direst calamity, it is those who all too often in the past have been allowed to preside over the ether cone, and whose main—and only—qualification to give an anesthetic has apparently been the ability to urge their victim to "breathe deeply." But all this has been changed and the administration of anesthetics has at last won the place in scientific circles its importance has so long demanded.

A reliable indication of the growing

importance of surgical anesthesia is the attention one of our most enterprising and successful contemporaries has given to the subject. We refer to the *American Journal of Surgery* which during the past two years has issued quarterly a comprehensive and admirably edited supplement devoted to surgical anesthesia in all its phases. Serving as the official organ of every one of the large associations devoted to the study of anesthesia, the *American Journal of Surgery* has had a wealth of valuable material at its command to submit to its many readers distributed all over the United States. The efforts of this live, aggressive publication have been most effective, therefore, not alone in spreading broadcast information showing the progress being made in the technique of surgical anesthesia, but what has been even more essential, in bringing the medical profession to a proper realization of the scientific importance of the subject and the necessity of the anesthetist being a well-trained, thoroughly experienced expert in the use of anesthetics.

Thus, without the slightest exaggeration, the *American Journal of Surgery* can be said to have done more through its quarterly supplements than any other single influence to dignify the work of the anesthetist and show beyond all possible question that it has become a form of special practice as vital and important as any concerned with the mastery of disease. It is such practical, constructive enterprise that tells more eloquently than words, how faithfully the independent medical journals are serving the profession, and through the profession, all humanity. The *American Journal of Surgery* has won a substantial success, a success that AMERICAN MEDICINE is glad of, for it knows what it represents in hard unselfish

work, earnest devotion to professional needs, and an unflagging pursuit of high ideals. Success, thus won, cannot fail to reflect to the credit of all independent medical journalism.

As we go to press, further evidence of the vastly changed status of anesthesia comes in the form of the *American Year-Book of Anesthesia and Analgesia*, which is also published under the auspices of the *American Journal of Surgery*. This is truly a monumental work, presenting as it does a most complete and authoritative exposition of anesthesia in all its aspects. Rich in material of the most practical and useful character, it brings the subject right up to date. A book that covers the whole science of anesthesia and analgesia as thoroughly as this *Year-Book* will be welcomed by every practicing physician, for while one may have no inclination to take up and specialize in this line of practice, it is imperative that every medical man shall be well posted on the subject. This applies with especial force to every one who operates at all, since anesthesia and its phenomena often produce certain conditions which the operator must be qualified to recognize and understand if he is to fulfill his full duty to his patient. All in all, this *Year-Book* is a work so encyclopedic in its scope that its fortunate possessor can assuredly depend on it to tell him whatever he needs or wishes to know on anesthesia and anesthetics.

We have discussed the foregoing matters with more than usual enthusiasm, for the reason that we earnestly feel that the excellent work on anesthesia that prompted our remarks represents a spirit in medical journalism that deserves more than a perfunctory word of appreciation. In an early number we shall give a comprehensive review of the *Year-Book*. At this time it has been our purpose merely to call attention to the substantial progress that has been achieved through the faithful well directed labors of an esteemed contemporary.

Good fruitful work is a constant source of inspiration, and we do not hesitate to express the firm belief that not the least of the benefits bound to accrue from the labors of the *American Journal of Surgery* in the field of anesthesia, will be the splendid incentive given to other purposeful journals.

**Improvement in dispensary management** has unquestionably taken place—in some localities to a very marked degree. How much of this has been due to open discussion of recognized evils, it is hard to say, but it is reasonable to suppose that the frank, above board consideration that has been given to the question of dispensary management by medical writers and in medical society meetings has not been entirely barren of results. Indeed, we are convinced that the special attention, for instance, that a local body—the Federation of Medico-Economic Leagues—has given to the evils that have been recognized for so long a time in our local dispensaries, has been productive of a substantial change for the better. As we have stated repeatedly in these columns medical men are responsible for a large majority of these evils. Not all of these are due to direct or wilful acts, to be sure. On the contrary most of them are the result of indifference, neglect and disinclination to bother one's self with matters or problems that one is not directly responsible for—or that one is not particularly interested in. In fact, the statement can be made without fear of contradiction that it is the passive or *laissez faire* attitude of medical men generally to which the continuation if not the origin of dispensary evils is mainly due. Granting this to be true, it is not surprising that arousing physicians to the situation has led in many instances to the institution of real and far-reaching reforms.

**Dispensary reform** has not been limited, moreover, to correction of the charity abuses. These were serious in the management of many institutions and had reached proportions in more than one locality that brought the conditions perilously near to a public scandal. It has been natural for conscientious medical men not to stop with the correction of one evil or group of evils. For a long time it has been recognized by thoughtful physicians that the treatment given to patients in many departments of large busy dispensaries is many times open to serious criticism. Too often important treatment requiring skillful technique has been left to young inexperienced assistants. Again, unless the medical attendants, clinical assistants, etc., happen to be men of

particularly strong character with well developed consciences, the temptation to slight certain patients is very great. And if this temptation wins the day, and a patient or group of patients are treated with less care than they would receive as private or pay patients, it certainly raises some question as to the assistant's fidelity. But this does not imply the moral turpitude it would seem to superficially. Take into consideration the conditions—a crowded clinic, patients of all nationalities, many of them unable to understand or to make themselves understood, dirty, foul smelling, and manifestly "rovers" i. e., prone to pass from dispensary to dispensary if they are not satisfied or fail to improve as rapidly as they think they should. If one of these patients—an ignorant foreigner, unable to speak a word of English, covered with vermin, unspeakably filthy, and uncertain as to his return for future treatment—happens to need gastric or colonic lavage as a routine procedure, will this be apt to be done with the same zeal and thoroughness the dispensary doctor would accord a private patient in his office—a person of intelligence, well-dressed, prosperous looking, cleanly in appearance, and altogether an individual of evident common sense, who can understand the doctor's instructions and be relied upon to return as directed for subsequent treatment? Exceptional indeed is the dispensary assistant, who however conscientious and honest he may be, will not be influenced by the conditions thus presented by these widely differing class of patients. In seeking, therefore, to correct dispensary evils—not the least of which have been hasty, careless or indifferent methods of diagnosis and treatment, tendencies to routinism, and so forth—intelligent medical men have taken cognizance of the essential difference between dispensary patients as a class and those of private practice.

Consequently, in many institutions open to criticism as to the efficiency of their methods of treatment, improvement has been sought by (1) preventing overcrowding, (2) increasing the number of assistants, (3) decreasing the number of patients allowed to come under the care of each attendant, (4) limiting periods of consecutive service, (5) instituting better record systems, and finally (6) organizing a plan to keep in touch with dispensary patients and

learn the results of treatment. The benefits from this last step have been particularly marked for it was found that one of the main causes of indifferent treatment of dispensary patients was the lack of definite knowledge of the outcome of the measures employed. On the other hand, it has been conclusively shown that there is no greater incentive to good conscientious treatment than to know that it is effective and productive of benefit.

The notable advances that have thus been made in many communities in the conduct of their medical dispensaries is gratifying, for no one will deny that the need for reform was urgent. But in spite of all that has been accomplished, there still remains one great abuse that sooner or later as a matter of social justice must be corrected. This abuse is the custom in dispensary work of requiring medical men to give their services without remuneration. If repairs are needed in a dispensary, is the carpenter asked to donate his work? If the plumbing system gets out of order, is the plumber asked to repair it and make no charge? If an employee of the dispensary falls down stairs, and brings suit against the institution, is the lawyer engaged to conduct its defence expected to do so without pay? Why should the doctor be the only one required to give his services? Is this fair or just? Does the doctor, in the last analysis, owe any greater obligation to the poor than those in any other calling who can serve them in one way or another? As a matter of fact, the burden of the indigent sick should be borne by the whole community. The subject is too broad to admit of full discussion *pro* and *con* at this time. But while we are commending the reforms that have been effected in dispensary practice, we wish to express the earnest hope that the movement will not stop here but will go on until prosperous communities recognize the justice of assuming the full burden of their sick poor, and paying for the medical attention they require as cheerfully as for other necessities. And when this day finally arrives—with communities supporting their dispensaries in a proper manner, and paying their medical staffs a reasonable wage—the care and treatment of the sick poor will enter upon a new era of efficiency. To paraphrase Patrick Henry—if this be medical socialism—the public can make the most of it.

**Astrology in Medicine!**—What? Is it possible that this relic of ancient and mediaeval superstition and barbarism can be seriously considered by an intelligent modern physician? Was not this so-called pseudo-science long since relegated to oblivion by sane people? We are informed to our surprise, that it has been resurrected and utilized by not a few physicians in America, in Germany and in England as well as in India and in other far eastern countries where it never died as it did in the occident.

This ancient, occult art is spoken of with respect by some in whom we have confidence and consequently it behooves us to treat the subject seriously—if questioningly. “Examine all things and hold fast to that which is good” seems a reasonable injunction and applicable to any subject worthy of attention.

To deny peremptorily the value of anything of which we know nothing would be worse than childish; at least, it would seem well to hold the matter in abeyance until careful consideration should bring the conviction of falsity or of truth. Should the findings not harmonize with our preconceived ideas it would seem unwise to exercise condemnation. The earnest, truth loving and considerate physician—and there are many such in practice today—rejoice when another of the profession finds a new aid to help him in the ever-active campaign waged against the common enemy—disease.

We are told that to obtain maximum aid from astrology some knowledge of mathematics and of astronomy is essential and that to satisfactorily apply its facts, a well balanced mind, clear perception, fine discrimination and a wide knowledge of human nature are requisite. In addition, when judgment is made from a medical standpoint, the wider the knowledge of anatomy, of physiology and of pathology possessed by the astrologer, the more reliable will be the diagnosis. The revelations made in the astrological chart are said to be startling as well as convincing. The susceptibility of the individual to special diseases is indicated; constitutional tendencies are shown; hereditary factors are disclosed and predilection to future ailments with their prognoses are pointed out, making it possible to apply prophylactic medicine with success.

If half the claims made by the advocates of medical astrology are substantiated, the

study and investigation of the subject by medical men would seem to be worth while. Much of it places a large tax on one's credulity.

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**The Control of Glanders.**—Dr. Lester H. Howard, Commissioner of the Massachusetts State Department of Animal Industry is reported to have declared that during the past year, or since the closing of all public watering fountains, there has been a diminution of 53 per cent. in the number of horses killed by that commonwealth on account of infection with glanders.

This is a very severe arraignment of the public watering fountains, but is wise and easily accounted for in the fact that glanders is one of the most virulent of infections from which animals suffer. The remedy is obvious; and yet it would entail great suffering and inconvenience to do away with the fountains, especially in cities.

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**Is Typhoid Fever an Accident?**—Can typhoid infection be classed as an accident? Undoubtedly it can for it comes under that class of diseases for which one can obtain causality insurance.

Webster's New International Dictionary 1913, defines an accident, “a befalling; an event that takes place without one's foresight or expectation; an undesigned, sudden, and unexpected event; chance; contingency; often, an *undesigned and unforeseen occurrence of an afflictive or unfortunate character.*” Typhoid being a preventable disease, should it be considered accidental when one becomes infected through undesigned and unforeseen occurrence? If an accident, would it come under the liability acts because of negligence as would an injury from a careless or unsafe construction or obstruction to a highway, rendering the municipality, county, state or government liable for damages? To give a concrete example: If the health authorities or inspectors allow a stream to become infected with typhoid bacilli and this stream should infect a spring or well from which drinking water is obtained, though it be remote from the original source of infection, is the county

or state liable for damages? Or could the government through neglect allow a military camp to become infected through imperfect drainage, thus infecting the drinking water, or through lack of proper screening, the food of the soldiers to become infected by flies which have conveyed the bacilli from the dejecta of typhoid patients be held accountable for sickness or death? The government and the several states have declared typhoid fever a preventable disease and as guardians of the public health are they responsible in the same degree for accidents to health as they are for those to life, limb or property through negligence in public buildings or highways?

It would be interesting as well as possibly surprising to have this question determined by our courts.

studying the vagaries of the stomach and in a recent talk to the Biological Club of the University of Chicago, he surprised his audience by telling them that the "mouth-watering" power of tempting viands was a myth. He said: "They do no such thing. My experiments have proved that the fact that a man smells and sees food while he is choosing it, has no effect whatever on the hunger contractions and only a negligible effect on the flow of gastric juice. You get precisely as much stimulation from a bill of fare as you do from seeing the food itself."

Other interesting findings by Carlson and his associates were that the old man or animal can go for a much longer period of time without hunger than the young one; and that headache and restlessness are not unusual accompaniments of hunger.

#### Time Required for Passage of Food Through Infant's Gastrointestinal Tract.

—About 1 grain of pulverized carmin was given to the infants as they were nursing, and the time of the appearance and disappearance of the stain in the stools was recorded. The infants were between 4 days and nearly 3 months old and were breast-fed and normal. The stools may show the stain in from 3 to 10 hours, and the stain may persist for a variable time; it never lasted longer than 21 hours in 8 of the 10 tests reported. The method is valuable for marking the stools from a certain feeding.

An arraignment of the lubricant jar appeared in the *Modern Hospital* for March, though the criticism was quite overshadowed by the experience as related. Reference was made to an epidemic of gonorrhreal vaginitis in the children's service of a "certain very large hospital." In spite of the greatest efforts to stop the spread of the disease, it spread until "not one single female child under three years of age in that hospital did not get the disease before the epidemic ran its course."

For a long time the course of the infection was an enigma, until someone finally thought of the lubricant jars that were used to oil the rectal thermometers, and every one was found to be infected with the gonococcus and the obvious measures caused the epidemic promptly to subside.

The lubricant jar, or for that matter all ointment jars, should be abolished for it will be easier to do this than to prevent people—including doctors and nurses—from putting their fingers, thermometers, rectal tubes or enema points into them. The compressible block tin tube eliminates all this and if it were more universally demanded, as indeed it should be, the dirty jar with its possibilities of harm so well illustrated above, would soon be a thing of the past.

**Modifying Our Ideas of Gastric Physiology.**—Every few years our notions of the physiology of digestion are changed. The "appetite juice" of Pawlow gave way to Starling's hormone secretin. Drinking at meals was claimed to be a detriment because it diluted the juices of the stomach and delayed digestion; while now it is believed that to drink water with the meals is an aid to digestion and an effective means of increasing both weight and strength.

A. J. Carlson, of the University of Chicago, has for a number of years been



## THE IRRITABLE HEART OF SOLDIERS AND ITS RELATION TO THYROIDISM.

BY

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The question of "The Soldier's Heart" has largely occupied the attention of medical writers for the last seven months.

On November 13th, 1915, three medical men published an account of cases in the *British Med. Journal* which they had observed and the irritability of which they attributed to a micro-organism they had discovered. On November 20th I pointed out that the symptoms which they described were simply those of hyper- and hypo-thyroidism, and from my observations on soldiers back from the front I showed that the irritable heart was entirely due to over-action of the thyroid gland.

At a meeting of the Royal Society of Medicine on January 18th, 1916, a discussion on the soldier's heart was opened by Sir James Mackenzie and his assistant Dr. Wilson. The latter gave a succinct history of the subject and referred to the reports issued by the committee appointed by the British Government in 1864. He also referred to the work of Dr. Harthorne published in the *American Journal of the*

*Medical Sciences* 1864, and to a paper by Da Costa in the same journal in 1871. Many medical men took part in the discussion at the Royal Society of Medicine, and many others have since aired their opinions in the pages of the *British Medical Journal*.

They all seemed to think that they were dealing with something which would mark a new epoch in the medical history of the present war. Numerous theories as to causation were assumed and a variety of treatment suggested, but while the experts were arguing, the patients suffered. It seemed to me that in the whole controversy, "what was new was not true, and what was true was not new." Accordingly I took up the subject where I had left it last November, and in the *British Medical Journal* of April 15th, 1916, I published a paper on "The Soldier's Heart and its Relation to Thyroidism."

I propose to make this paper the basis of my present contribution with such additions as I feel can be further added to the controversy.

When the editor of the *British Medical Journal* accepted my offer to write on this subject I felt that it required some temerity to enter an arena where so many doughty champions had recently striven for mastery, and not one of them, in his own opinion, knocked out of the ring. I read all the

letters and articles in the *Journal* on their publication, and imbibed as little as I thought necessary. Unfortunately this has involved a second reading (a form of amusement which I do not much appreciate), in order to find out whether all the writers were dealing or intended to deal with the same cardiac affection, or whether each writer had a particular disease of his own to describe. However hazy the ideas of some of them may have been, I came to the conclusion that they all intended to deal with the old "irritable heart."

The contributions of Dr. Alexander Morison, and his references to the soldier's heart as part of a general state of nervous exhaustion are excellent so far as they go, but he does not carry us far enough, and is apt to leave us in that neurasthenic land of the destitute. On the other hand, I should like to employ to Sir James Mackenzie's article on "The Soldier's Heart" the language which he used to Sir James Kingston Fowler. It is "vague, immature, insisting on the immaterial, and neglecting entirely the essential." On causation he is not the only writer who flies to that resort for the destitute—microbes and their toxins—to explain all the ills to which flesh is heir. It is to be noted that there is not a single bacteriologist on whose evidence one would condemn the most harmless staphylococcus in support of this view; the reason, perhaps, is that bacteriologists have had a scientific training, which makes them less prone to jump to a conclusion than the clinician, who becomes very positive on the subjects which he least understands. The modern heart specialist often does not even consider an elementary knowledge of physics essential for his specialty.

It is well recognized that in diphtheria, in typhoid fever, and, in fact, in any case

of prolonged high temperature, cloudy swelling of the myocardium, as well as of the liver cells, may occur. In rheumatic fever the myocardium is often involved, and this can readily be recognized two or three days before the appearance of any murmur by the delay in the transmission of the pulse wave. In the case of the irritable heart the sounds are short and sharp even when there is a murmur, and there is no delay in the pulse wave—the interval between the mitral first sound and the pulse at the wrist is barely appreciable. Influenza often gets the credit of causing heart mischief, but it usually seems to me more of the nature of a neurosis accompanied by pain than a myocardial infection. Moreover, the alcohol which is too frequently and too freely administered may have some share in the causation, especially in those cases in which there is dilatation. The heart's action is quickened, the sounds short and clear, and in these respects it differs from the myocardial condition in diphtheria.

Like the civilian the soldier is liable to all the varieties of heart disease, but what seems to me strange is that although almost any kind of heart, according to Sir James Mackenzie, is good enough for a recruit, a large number of recruits get bowled over with some functional disease of the heart even before they reach the trenches. So bad does this irritable heart seem to be for those who have passed the recruiting stage that Major Bradshaw goes so far as to say that they should be invalidated out of the service. If this were an established order it would be a simple matter for any one who has no stomach for fighting to get released.

In all cases of irritable heart which I have seen there has been some enlargement

of the two lateral lobes of the thyroid gland with increased function. I have also found that gland enlarged in a considerable number of cases of frost-bite, or to be fashionable I suppose I should say "trench feet"; and I hope to show some relation in the causation of these affections. I am well aware that the enlargement is not always very apparent. The thyroid gland is best examined with the patient lying on his back with his shoulders and head supported on a gentle incline from the waist upwards; the two lateral lobes can then be easily felt internal to and behind the sterno mastoid muscles. If the patient raises his head, so as to make the muscles and fascia tense, the whole gland disappears as if by magic. There is usually some throbbing to be felt in the carotids, and possibly also in the arteries supplying the thyroid.

#### HYPERTHYROIDISM.

In a paper on the functions of the thyroid, the suprarenal, and pituitary glands,<sup>1</sup> I said:

Exophthalmic goitre is now, I think, almost universally acknowledged to be due to excess of function of the thyroid gland. In the case of marked exophthalmos a large pulsating thyroid, tachycardia, general nervous trepidation—the patient in an apparent state of fright, emaciation, a moist skin with consequent lessened electric resistance—any fool can tell what is the matter; but there are an enormous number of cases of hyperthyroidism in which there is no exophthalmos, no apparent enlargement of the thyroid, and no pronounced nervous symptoms. However, in these cases an intelligent observer will readily detect a tendency to emotional and vaso-motor disturbance, a warm moist skin, warm extremities, active capillary circulation, rather high venous pressure, rapid action of the heart and the rate easily increased by any mental excitement, the knee-jerks and all

the deep reflexes increased, and slight muscular tremor may be appreciable. In all degrees of hyperthyroidism the urine may contain a slight amount of albumin, especially after getting up; this corresponds to the so-called albuminuria of adolescence, and is associated with deficient vasomotor tone and a lessened amount of fixed lime in the blood. The free lime in the blood may or may not be increased, but there is always an excessive excretion, except when there is a very small intake. In cases of hyperthyroidism there is a state of unstable equilibrium; the individual is sharp, alert, even vivacious, but easily exhausted both mentally and physically, and so incapable of sustained effort.

The causes of the thyroid taking on this over-action, beyond the necessities of the system, are still rather obscure. This over-action cannot have any necessary connection with the condition of the water in goitrous districts, because the large fibro-cystic masses are associated with lessened function of the gland, though of course in many such cases there may have been a primary excess of function, and we know that many cases of exophthalmic goitre end in myxedema. However this may be, many are of opinion that the cause is water-borne, and can be destroyed by boiling, but the proof adduced in support of this contention is far from conclusive.

We know that the active principle of the gland contains iodine, and that excess of function of the thyroid is always associated with excess of iodine in the gland. I have seen two cases of exophthalmic goitre, including well-marked exophthalmos, produced by a prolonged use of tincture of iodine, and both cases were rapidly cured by stopping the iodine and placing them on a calcium mixture. There may be sources of iodine difficult to trace in individual cases, but in every case one should keep his faculties of observation alert, try to find out the cause, and remove it. In every case the urine should be examined for iodine, though it is not often found unless the patient has been taking an iodide. Many medical men will tell you that they prescribe iodine and thyroid in such cases with advantage, but upon what grounds I cannot say, unless it be a hair of the dog that bit you, or the homeopathic doctrine that like cures like; in that case, the more infinites-

imal the dose the better. It may, however, most likely be that in such men's minds there is a confusion between over-action and under-action, exophthalmic and fibro-cystic goitre.

In the textbook etiology of hyperthyroidism the common cause, the female sex, is absent, but some men are as emotional as women. In the latter the thyroid gland is usually active about the menstrual period and during the early months of pregnancy. In men the suprarenal gland is ordinarily the more active, but in neurasthenia and in some febrile affections, such as diphtheria and pneumonia, the adrenalin function may be inadequate, and thus the controlling influence over the vasomotor system is lessened. In war other assignable causes are in force, such as mental and physical strain, worry, anxiety, and fear, vicissitudes of climate and temperature, want of sufficient rest and sleep, too much meat and not sufficient milk and cheese, and too much tobacco.

No wonder that under such conditions which go to make up the life of the soldier we should get great vascular disturbance and increased function of the thyroid gland. In great dread of any impending catastrophe the heart makes its presence felt by thumping against the chest wall. Anticipation is worse than action. When it was pointed out to the Irishman that, from his description of his wound, the bullet must have passed straight through his heart, he replied, "In faith my heart was in my mouth at the time."

The intensity of the symptoms varies very much, according to the excess of function rather than the mere size of the gland. In the cases of "the soldier's heart" the subjective symptoms are referable to that organ, but any careful observer should no-

tice many other indications of increased thyroidism. The cardiac beats in these cases are frequent, usually from 80 to 120 in the minute, and the number is greatly increased by any emotional disturbance. This quickened action is accompanied by a certain amount of palpitation.

The eyes are, as a rule, not very prominent, but the sclerotics are frequently more than usually visible. The skin is warm and moist, except in cold weather, but even when the hands are cold the head is warm and the face often flushed. The tongue is rather tremulous and often indented at the edges by the teeth, there is usually some muscular tremor, a certain amount of trepidation and abruptness in manner. There is great dissipation of heat, and consequently when the body is much exposed to cold and wet the extremities become very cold and the fingers often dead, especially the distal halves. When the blood pressure is low the fingers and hands may get livid or purple and somewhat swollen from the slow capillary circulation, but this can be remedied by hanging the hands down and exercising them so as to increase the velocity of the blood in the capillaries. The toes may be a little livid when the patient is lying down, but not when he is standing up, as in the latter position the velocity of the capillary circulation in the feet may be at least quadrupled—always provided that the arterioles have not been so contracted by the cold as to shut off the capillaries. This condition of the circulation renders these men particularly liable to frost-bite, or the modern trench feet.

There is another strongly predisposing cause, a deficiency of lime salts in the circulation. This arises from insufficient intake and the excessive output which accompanies hyperthyroidism. The soldier's

rations, in my opinion, do not contain a sufficient amount of calcium—the milk is scarce and each man only gets about 2 oz. of cheese daily. Whenever there is severe muscular work there should always be a large intake of lime. In mountain climbing I always increase my own supply. When there is hard work there is no danger in taking too much; a certain proportion is not absorbed, and any excess in the circulation is quickly excreted. In cases of "the soldier's heart" we get, as Dr. Jamieson Hurry would say, a vicious circle; the deficiency of calcium salts in the blood is a contributory cause in the production of hyperthyroidism and frost-bite, and the excessive action of the thyroid leads to great calcium metabolism.

So far as we at present know, the presence of free calcium ions in the blood and tissues is necessary for effective muscular contraction. The calcium ions increase the force of the muscular contraction, but diminish the irritability of the muscle, and, according to Loeb, inhibit the rhythmical contraction of muscle fibres, which he thinks does not depend on lessened excitability, but on some chemical combination of the calcium ions in the muscle which renders its rhythmical contraction more difficult or impossible. Sydney Ringer, in association with Dudley Buxton, showed that the effects of the salts of sodium, potassium, and calcium on skeletal muscles were somewhat different from their effects on the heart. The contractility of skeletal muscles perfused with normal saline solution lasts longer, but when exhausted there is greater delay in relaxation. The contractions are strengthened and the relaxation delayed by potassium salts. On the other hand, the lime salts accelerated both contraction and relaxation. Personally, I

have usually found that patients liable to cramp had a deficiency of lime in their blood, and thus the remainder contraction, so apt to occur in exhausted muscles, is not counteracted by a sufficiency of calcium. I still hold my former opinion that the calcium ions lessen the irritability of the heart muscle, and Blair Bell has shown that when a solution of calcium chloride was injected into the vein of a rabbit the rhythmical contraction continued, the amplitude of the contractions increased, but their frequency diminished, and when a poisonous dose was used the heart finally stopped in systole.

The late Ralph Mines showed how cardiac contraction was due to a difference in electrical potential between the ions within and without the cells.

We have many reasons for believing that the excitation process in muscle can be dissociated from the contractile process, and it seems clear that the electric variation is a direct index of the excitation process, while the contraction is a sequence, usual, but not quite inevitable. Just as in nerve, excitation occurs (but no contraction), so in muscle excitation occurs; if the contractile mechanism is in order excitation is followed by contraction.

In an experiment which I witnessed in his laboratory it was seen that the electric variation preceded the contraction of both the auricle and the ventricle, and, whether the cause or not of the contraction, it began the sequence of events, and, therefore, could not be the result of the contraction. In every case of excessive muscular action there is a great waste of lime salts, hence the necessity of a large intake.

The blood pressure in hyperthyroidism is very variable and merits special consideration. There is lessened peripheral resistance, the viscosity of the blood is diminished owing largely to a deficiency of fixed lime, the arterioles are relaxed, and the

capillary circulation is active and free, all of which tends to lower the arterial pressure—at least the diastolic pressure. On the other hand, the capillary and venous pressures rise, the supply of blood to the heart is great, the ventricular cavities are large, and the systolic output great. Therefore, the systolic pressure may be fairly high, but as the arteries are large and the peripheral resistance low, there is a great fall in the pressure gradient, with a relatively low diastolic pressure. This great difference between the systolic and diastolic pressures means an inefficient circulation; it is therefore important that vascular tone should be maintained, and it is for this reason that adrenalin plays an important part in the treatment. When there is a great disparity between the systolic and diastolic pressures, and more especially when the systolic is relatively high, we get longitudinal straining of the large arteries, and marked recoil of the heart. It is this recoil which causes the thumping of the heart against the chest wall which is of frequent occurrence in hyperthyroidism, and is especially marked when a runner comes to a standstill after a strenuous race. In free aortic regurgitation this recoil often shakes the bed on which the patient is lying. It is often noticeable after an extra glass of spirits when the body is in a warm atmosphere. I do not mean that the extra glass, which develops the palpitation, is the only one which works the mischief, but it is the final straw, and the amount of the previous load will depend on the strength of the liquor and the capacity of the individual. This is an early stage in the development of the German beer-drinker's heart, which eventually ends with great hypertrophy and dilatation. "The soldier's heart" seems to be giving as

much trouble in Germany as in this country. Dr. Goldscheider, in an interesting address, concludes that "the war had brought into unflattering prominence the ignorance of the medical profession of a group of symptoms with which a very large proportion of the soldiers in the Germany army were invalidated."

The victims of the "soldier's heart" are easily exhausted and get short of breath on slight exertion, but pain in the cardiac region is not a very prominent symptom unless the heart be dilated. When lying in bed the heart gives very little trouble, unless the patient is suddenly startled or suddenly assumes the erect posture. These patients are liable to febrile attacks, but that forms no part of the cardiac trouble.

The large class of cases of hyperthyroidism covers much more than "the soldier's heart." When the cardiac phenomena are prominent the diagnosis seems to be fairly obvious, but if the heart does not come into prominence, which it often does not, then the cases are pushed into the neurasthenic class. When one of these patients sometime back from the front is asked what is the matter he blurts out "Neurasthenia," and at the same time looks startled. It is then time to point out that there is no object in having neurasthenia at present, as although in civil life the shocks to which he had been subjected would be sufficient to satisfy any jury that he was suffering from traumatic neurasthenia, yet the Workmen's Compensation Act does not apply. There is no railway company to attack, and it is somewhat doubtful whether there will be any pensions for neurasthenia, or even frost-bite. Moreover, a neurasthenic patient should not suffer from a flushed face, hot head, excitable pulse, and a general appearance of fright.

I recently saw a marked case of hyperthyroidism most unjustifiably dubbed neurasthenia.

A lieutenant, aged 25, joined the army soon after the commencement of the war, very keen and anxious to excel. He had hard work training, and on one occasion fainted at drill. Again in London he fainted in the street, was seen by a doctor, who said that he had a large heart. After this he spent some time in a nursing home under a physician who does not seem to have given diagnosis except that his heart was not enlarged. He then went for a course of training at Winchester, and finally was sent to France in November, 1915. He had rather strenuous work, and as a bombing officer his duties were chiefly at night; he was seldom in the trenches in the daytime except to see that the bombs were all right. He had no fear of shells or other missiles, but he could not bear to see a man on a stretcher; if any one fainted he was apt to do the same. About the middle of January he collapsed in the trench, was carried out and invalided home; a medical board in London recommended his discharge from the army as unfit for further service owing to neurasthenia. He did not feel inclined to take this verdict; he went to his regiment surgeon, who said that there was nothing the matter with him, and ordered him to his depot. It was soon found that he was not able to stand the fatigue of constant drill, and his commanding officer requested him to see me.

He gave me the impression of having a somewhat startled, not to say frightened, appearance. He complained of being easily exhausted, getting short of breath on exertion, often troubled with palpitation and throbbing in the vessels of the neck. He gave way at the knees, and felt that he would like to lean against a support; any extra exertion caused exhaustion, and on suddenly assuming the erect posture he felt faint. He perspired freely and usually felt warm, but often the ends of his fingers became pale and dead. His head usually felt hot, and he was often confused in his thoughts, and incapable of sustained mental effort. He was emotional, and often felt inclined to cry without any reason. There was slight general tremor, muscular irritability, and *tache* easily developed and

very persistent. The knee-jerks were excessive. Heart 2 in. to the right, and  $4\frac{1}{4}$  in. to the left of the mesial line; sounds short and clear, no murmur, second pulmonic sound rather accentuated. Pulse 84 recumbent, on assuming the erect posture 120, afterwards falling to 96. Blood pressure; diastolic 110, systolic 150 mm. of mercury. Urine 1,024, acid, a trace of albumin, lime deficient, phosphates normal; appetite bad. Height, 5 ft.  $8\frac{1}{4}$  in. Weight in shirt and trousers, 10st. 11lbs.; he had lost some weight. I ordered him a month's rest, a liberal diet with plenty of milk food, and a mixture of adrenalin and lime salts.

In this class of cases there is not only over-action of the thyroid but under-action of the suprarenals. The patient often feels faint, and there may be sickness, and even vomiting; on quickly assuming the erect posture he may feel giddy, and there is a great increase in the frequency of the pulse, which becomes small and feeble owing to the blood gravitating into the abdominal cavity and the failure of the vasomotor mechanism to adjust its action rapidly to the altered conditions; and there is frequently orthostatic albuminuria. These phenomena have been aptly termed "cardiosplanchnic paresis" by Albert Abrams. In these cases an abdominal belt worn tightly does good.

What strikes me is that the obvious relationship between the irritable heart and hyperthyroidism should have gone so long unnoticed, that even supposedly careful observers can go about the world blind to the simplest fact until it hits them in the eye. They cannot see the wood for the trees. They are quite ready to give a dozen explanations of anything which they do not understand, like the ancient Fellows of the Royal Society, who had a learned disquisition and many reasons why a fish does not displace water, until Charles II. asked them to try, and lo! the fact confuted their theories. It would be well if medical men would

remember the dictum of Sir Isaac Newton "that we should admit no more causes of natural phenomena than such as are both true and sufficient to explain their appearance" or that of Sir William Hamilton, "Neither more, nor more onerous, causes are to be assumed than are necessary to account for the phenomenon."

In the minds of many medical men there is still a hankering after microorganisms and their toxins to explain all the ills to which flesh is heir, including the soldier's heart. Recently I had to remind Mr. J. G. Turner that the usual septic organism found in the mouth and nasopharynx and their effects are well known, but the symptoms to which they give rise, when they or their toxins find their way into the circulation, are not those of the soldier's heart. He says that "practically every soldier is the subject of some degree of dental or nasopharyngeal sepsis," but you will find sepsis just as common in the civil population without the occurrence of the irritable heart. Can anyone imagine Sir Isaac Newton having a dozen causes to explain the fall of an apple? Personally I am always proclaiming a raid on oral sepsis, but I see much which appears perfectly harmless even when the breath stinks. So long as the organisms remain on the surface they can be disregarded, though in the interests of cleanliness, of dentistry, and of outsiders this is not advisable.

Moreover you cannot cure the irritable heart by eradicating the sepsis; there are many cases of the soldier's heart without any evidence of sepsis or septic absorption, and the symptoms continue after the dentist has worked his sweet will.

On the other hand the soldier's heart is invariably associated with a more or less enlarged and over acting thyroid; the symp-

toms of the soldier's heart, pure and simple, are those of hyperthyroidism and of nothing else. Of course there are many cases of tachycardia without any excessive function of the thyroid, and we should not confuse merely rapid action of the heart, however frequent, with hyperthyroidism which presents many other definite symptoms.

A captain friend of mine who has spent many months in the firing line tells me that these cases do not receive much consideration at the front, they are treated as cases of funk and he thinks the diagnosis is not far out. This observation may be of value in the consideration of the causes of hyperthyroidism. When the patients get back to the base he says they get into the hands of men who have more time on their hands than they know how to profitably employ, and then the cases are labelled valvular disease of the heart and sent back to England, where they are said to be suffering from a new disease; are often drafted into special hospitals, and lo! the last end of the man is frequently worse than the first.

At present you can count these cases by the score in any large military hospital or convalescent home. What immediately arrests the attention of any keen observer is the startled or rather frightened appearance, flushed face, moist skin, and hot head.

The disease is plainly written on the man's face, yet the thyroid is overlooked unless his eyes are jutting out of his head; and the disease is labelled valvular disease of the heart, neurasthenia, tachycardia, or some other inappropriate name.

#### HYPOTHYROIDISM.

In many cases of frost-bite, even when the thyroid gland is enlarged, its over-action has disappeared before the patient reaches England and frequently there is

a state of hypothyroidism, with feeble circulation and cold blue extremities. These cases are easily treated. There are also cases of hypothyroidism in stolid men who would not move a hair if shells were bursting all round them. I had recently a friend under my care—a distinguished officer of a high and well-merited reputation, mentioned in dispatches and honored by the King. After twelve months' strenuous work, want of rest, and not troubling about his food, he lost over 4 st. in weight. His condition was noticed by his superior officer, who advised him to take a rest. He did not think it necessary, but in obedience to the command he returned to London, was examined by a medical board, which gave him two months' leave.

When I saw him he chafed under the long enforced idleness, but I told him that two months were little enough. I ordered him to bed, told him that I would see him when I thought it necessary, that he was to put on at least 2 st. in weight, otherwise he would require a new uniform. About medicine and diet I would speak to his superior officer, and she would see that my instructions were carried out. Notwithstanding his great loss of weight I felt confident from his slow, feeble, intermittent pulse and other symptoms that there was deficient thyroid action, and among the remedies I ordered was a 5-grain thyroid tablet daily. He rapidly improved, gained over 2 st. in weight, and was soon fit for plenty of exercise. Before the two months were up he happened to be in London, and sought a medical board, the president of which told him that he could not pass him for foreign service. He then appealed to be examined by the junior member of the board who agreed with his senior. This seems to be a much more common custom in the

army than in civil life. When I saw him he was annoyed, as he wanted to be back in the scene of action. I told him that it was his own fault, that he had thought himself too well and had stopped treatment. I had no doubt that his heart had astonished the examiners by intermitting a few times, and that had frightened them. There is an alderman in the city of Liverpool, aged 90, who can still do a long day's fishing and enjoy his dinner with the youngest of us, yet he has had an intermittent heart all his life and was several times rejected for life insurance. I told my friend that he was unfortunate in not having been examined by Sir James Mackenzie, because he might have told him that intermissions do not count, that he had an excellent heart for a recruit, and it might last him till the age of Methuselah if he did not die in the meantime. My own opinion was that his heart was good for this war and somehow on to the next if he did not get in the way of a shell. I told him that he should be like a medical student who always studies the iodiosyncrasies of his examiners when going up for an examination. I told him to resume his 5-grain thyroid tablets, to take one every day of his life, and it would save him many medical prescriptions and keep him out of the hands of the modern heart specialist; but for a week before his next medical board he was to take a tablet night and morning and stop tobacco. In the meantime he should go off to Scotland and get some shooting. In a few weeks he passed another medical board, he told me, with flying colors.

I wish to take this opportunity of pointing out that there are large amounts of thyroid preparations on the market more or less useless. It is unfortunate that we should be so much dependent on the reputa-

tion of the druggists—wholesale and retail—for the quality of our drugs. Thyroid preparations should contain at least 0.2 per cent. of iodine, but in many samples I have failed to find a trace. Of course, it is easy enough to add iodine to the preparation, but whether the added iodine is as effective as that which should be naturally in the gland is another question. However, I often find that the effects of thyroid are enhanced by the use of iodine at the same time. A favorite prescription with me is a mixture of calcium iodide, tincture of iodine, and the syrup of lactophosphate of lime.

The treatment of these cases is that of hyperthyroidism and hypothyroidism, which every one should know. Dr. Florence Stoney and others strongly recommend x-rays in cases of hyperthyroidism. I used the x-rays in many cases with some benefit ten years or more ago, but latterly I have not done so, as all my cases have done very well without the rays. I have no objection to their use, but I think caution should be exercised for fear of overshooting the mark.

Morgagni. The glandular structures are placed there for a specific purpose, viz.: *for the secretion of a protective and immunizing mucus*, entirely distinct and different from that secreted by the glands lining the other segments of the urethral tract. French observers maintain that the secretion of some of the glands of Littré is specifically concerned in acting as a prophylactic against gonorrhreal infection. How true such a contention is, remains to be ascertained by future observation and study. Suffice it to say however, that pathologically, these glands are of much importance, as we shall have occasion to learn later. They penetrate the entire submucosa, the apertures of their ducts opening obliquely into the mucosa of the urethra. If these ducts become altered by a gonorrhreal infection, one may readily discover them on endoscopic examination of the urethra, as red punctae or small crypts. Aside from the ducts of the glands of Littré similar crypts have been found to be embedded in the mucous membrane in the form of blind pouches or cul de sacs. These are termed

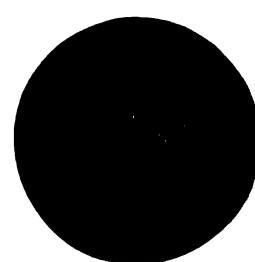
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## A CONTRIBUTION TO THE STUDY OF DISEASES OF THE URETHRAL GLANDS AND CRYPTS.

BY

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Upon examining the mucous membrane of the pars anterior or pendulous portion of the urethra, especially so on its anterior wall, one may detect various structures, partly consisting of compound rasemose glands and partly composed of blind crypts or lacunae. The former are termed the glands of Littré, the latter the crypts of



URETHRAL CRYPT.

the *crypts or lacunae of Morgagni*; they are of great moment for us in the course of a gonorrhea, as it not infrequently happens, that the process becomes permanently and preferably localized in these glands and crypts and firmly implanted into them; thus cases of gonorrhea may be prolonged indefinitely; for it is exceedingly difficult to

destroy the gonococci, if once they find access to the above structures.

The *pathology* of the process is obvious. The gonococci gain entrance into the ducts, producing an acute inflammation of both the ducts and the glandular tissue, that may readily be detected on palpation as pea sized nodes along the course of the anterior wall. If the condition assumes a chronic aspect the proliferative process may subside; yet the discharge continues unabated and the gonococci are readily demonstrable. If the crypts of Morgagni are implicated, no gross palpable lesions are apparent, save for a copious secretion, that is intractable and only with difficulty yields to the most painstaking efforts on our part.

#### SYMPTOMATOLOGY AND DIAGNOSIS.

The diagnosis is rather difficult. Yet the process can be eventually recognized, if the proper methods are instituted in differentiating these lesions from others affecting the urethral tract. At this juncture it must be remarked, that the gonococci alone are not the only organisms which are responsible; the micrococcus catarrhalis, staphylococcus and colon bacillus may likewise be concerned in their causation. If the process is acute, the glands may be readily detected—as has been intimated above—as nodes of varying size, usually that of a split pea, along the course of the canal. No difficulty whatsoever should be experienced in eliciting an acute condition. But if these structures become chronically affected then they present problems in diagnosis, for one is unable to differentiate them from a chronic urethritis. The three and five glass test is of no value in such cases. Palpation upon a sound likewise gives but meager data; the symptoms are that of ordinary chronic urethritis and the only procedure that is

likely to facilitate the diagnosis is the *urethroscope*. This instrument should be utilized in every chronic condition, independent as to the actual location of the lesions and their particular type.

An anterior tube may be used, although a posterior is perhaps more preferable owing to the larger field that presents itself into the fenestrum. On viewing the presenting area, small, red prominent punctae are discerned that are almost typical in comparison with the normal mucosa.

*Illustration.*—Unlike granular urethritis, they do not bleed when touched with the applicator; on the contrary, they impart to the finger a feeling of resistance, as if the probe were passing over a slightly raised ridge or follicle. The affection of the crypts of Morgagni is still more difficult of recognition. On endoscopy they exhibit a picture of minute crescents or linear curves, suggesting an overlapping of the mucosa. A very thin probe may detect an opening, not more perhaps than one line in depth.

Many cases of so-called chronic gonorrhœa, that upon a thorough glass test excludes the presence of posterior urethritis, and wherein the seminal vesicles and prostate are intact and the discharge is the only predominating feature, perhaps with a history of a preexisting acute follicular inflammation, would indicate an implication of the glandular structures and lacunæ of the canal. *Urethroscopy, therefore, is the method par excellence to establish the exact nature of the pathologic process.*

#### TREATMENT.

Even if the morbid process is distinctly understood and the lesions on endoscopy properly interpreted, the treatment is far from satisfactory. In acute inflammation

of these glandular structures, we must *refrain from any instrumental procedure for fear of intensifying the condition.* But given a case that suffers from a chronic involvement of the urethral glands and crypts, and where mechanical measures would seem the most appropriate and logical ones to employ, even then the prognosis is problematical as to the ultimate outcome. After determining the nature of the urethrorrhœa by urethroscopy, we should endeavor to treat the individual lesions of the glands separately by the use of the endoscope. At first strong solutions of silver nitrate 10 or 15% may be used. If the condition is not ameliorated after 5 or 6 applications, then recourse must be had to the urethral knife. This has a spear shaped pointed blade, not unlike that of a Graefe knife. The urethroscope is introduced, the lesion is precisely located, dried thoroughly with a pledge of cotton, wrapped around a wooden applicator. Local anesthesia is very seldom required. The urethral knife is inserted into the tube and the lesion or lesions incised or rather scarified and subsequently, cauterized by silver nitrate solution 10-15%, or tincture of iodine. If necessary the process must be repeated. Perseverance, however, is the keynote to success. And yet with our best efforts we are not always successful.

It is needless to say that microscopic examinations must always be made prior to treatment, as well as periodically during it, so as to ascertain both the character of the infection, as well as the result of our efforts. Astringent hand injections must never be used; a decrease of the discharge calls a halt in the treatment and for a time we should merely observe our patients, avoiding any interference, unless there be a positive indication. Bacterins are both useful

in acute and chronic cases; the mixed forms should always be used, for very seldom do we encounter a pure and simple infection. The *prognosis* to the patient should be guarded, for one can never foretell the outcome of such glandular involvement.

In conclusion the following should be kept in mind dealing with all cases of chronic urethrorrhœa not due to a posterior urethritis:

1. That the glands of Littré and crypts of Morgagni may be implicated in the process.
2. That for a proper recognition of the lesions the urethroscope is indispensable.
3. That for the effective handling of these lesions urethroscopic treatment is the only logical method of procedure.
4. That the prognosis in these cases is always problematical.

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## ANGINA PECTORIS, WITH ESPECIAL REFERENCE TO THE USE OF CRATAEGUS OXYACANTHA IN ITS TREATMENT.

BY

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The term "angina pectoris" is often mistakenly used as the name of a disease rather than that of a group of symptoms caused by various metabolic disturbances.

There are also many medical authorities who mention at the present day two types of this disorder, a true (angina pectoris vera) and a false (pseudo angina pectoris). Those who hold to there being two types of this affection, ascribe the so-called true angina to be due entirely to an atheromatous condition of the coronary arteries; and for many years this was the only form mentioned in the medical schools.

Within the past few years there has been a gradual change in the opinion of many observers. Some approach the subject by qualifying various concomitant disorders as being among the causative factors, while many still hold to the sclerotic condition of the coronary vessels theory. Several have taken the middle course, and the writer can not but agree with them. There is no doubt more than one causative factor is at work to cause the symptom complex, which for want of a better name we call angina pectoris.

Von Leube<sup>1</sup> states that "the origin of these attacks is probably to be attributed to the sudden anemia of the myocardium predisposed by arteriosclerosis of the coronary arteries, and the thereby impeded blood supply to the myocardium. \* \* \* \* \* But it is conceivable that a similar, although less dangerous final result may also be produced by vascular spasm; hyperirritability of the cardiac nerves, and toxic influences. \* \* \* \* \* I do not consider it necessary formally to separate a sternocardia which has occurred, on the basis of angina pectoris vera from pseudo angina pectoris."

Musser<sup>2</sup> writes that "the attack may occur in patients who are free from organic disease of the heart. It is, however, most commonly associated with some lesion." He further declares that "*hysterical or pseudo angina pectoris* can be distinguished only with extreme difficulty."

Louis Faugeres Bishop<sup>3</sup>, in his recent book on "Arteriosclerosis," states: "Personally I have never in recent years made a diagnosis of pseudo angina pectoris. I think this name is silly. If a man has a severe cardiac pain, he has angina pectoris, because that is the only clinical name for the worst form of cardiac pain. The simplest kind of pain can develop into the most serious."

If the practitioner would observe his patients who suffer from this disorder he will be convinced of the correctness of the assertion of Dr. Bishop. In the individual case we are able to notice pain of varying intensity at different attacks. Whether the pain is mild or severe, there can be no doubt of the distress from which the patient suffers, nor of the urgency with which relief should be given.

#### What is angina pectoris?

Lippincott's Medical Dictionary (edited by Dr. H. W. Cattell), gives as a definition "Spasm of the chest; a disease attended by acute pain, and syncope. \* \* \* \* It is due to a sudden spasm of the systemic arteries, disease or aneurism of the aorta."

The observations of the writer have led him to believe that angina pectoris is essentially a cramp of the cardiac muscular fibres of varying intensity, which may occur at any point in the heart muscle, but apparently has its most frequent site at or about the aortic orifice, causing a partial stenosis.

The predisposition to these attacks may be due to changes which have taken place in the coronary arteries, affecting the circulation in the heart muscle itself, or to some metabolic change affecting the nervous, muscular and vascular structures generally. Anginoid attacks may be induced in many ways. Sufferers from this disorder are subjected to attacks upon the slightest muscular exertion, whether on a level surface or going up an incline; physical and mental overwork; violent emotions; unpleasant dreams, and very frequently fatal attacks have occurred during a spell of acute indigestion.

In all the cases which the writer has observed there has been a strong neurotic element as an exciting cause. The coronary

vessels may or may not be diseased (if they are the prognosis is more serious), but these vessels are *not* the only ones affected; the entire vascular system is more or less participant in the sclerotic changes going on in the economy. In fact, the general condition of arteriosclerosis which is present interferes with proper vaso-motor action, causing thereby a back pressure in the blood current, thus leading to greater distension of the myocardium. This overdistension acts as a stimulus to the inhibitory nerves of the heart; the cardiac muscle responds to this stimulus with a cramp-like or convulsive action, as is demonstrated by the palpitation, irregular rythm and angina which follows. If this convulsive act is too prolonged or too "tonic" a sudden fatal termination will result.

It therefore becomes evident that we must search for the causes of the defective metabolism in order that we may ameliorate this condition, and remove them whenever possible; modifying diet, exercise and vocation. While the organic changes which have preceded these attacks may not be altered to any great extent by treatment later instituted, further disorganizing changes may be held in check by careful regimen, and proper medication.

The immediate relief demanded by an attack of angina has caused us to resort to the use of antispasmodics, such as amyl nitrite by inhalation, and the exhibition by mouth or by hypodermic injections of preparations containing digitalis, nitroglycerine, cactus, belladonna, etc.; and sedatives such as chloral hydrate, the bromides and often opiates.

These drugs have but a transient effect, and frequently the fear of an attack may develop a pernicious habit in a patient who

has been given relief upon a former occasion by the injection of morphine.

Nitroglycerine is one of the most active antispasmodics, and is the drug best suited for the immediate relief of the present attack, but it does not effect a cure. It is handy for the patient to carry and is easy to take, by simply allowing a granule containing 1-100 to 1-250 of a grain to dissolve in the mouth, which it does instantly. The effect of this drug is obtained in a few seconds after taking; it imparts a slight tang to the tongue, and a sense of fullness in the head, which lasts from several minutes to a longer period. The headache which occasionally accompanies the exhibition of this drug may be considerably modified by ascertaining the minimum dose required in a given case in order to secure prompt relief.

Another drug to which my attention was called several months ago for the relief of these cases is the *crataegus oxyacantha* (English hawthorne). I have used this drug frequently since it was first brought to my notice, not only in cases of severe angina pectoris, but also in many other cardiac disturbances.

*Crataegus oxyacantha* is a drug seldom mentioned in the text-books of the "old school," as I have found after a fairly thorough search in many works on *materia medica*, without even finding the name of the plant spoken of. Therefore a brief resume of the history of this preparation may not be amiss:

*Crataegus oxyacantha* was first brought to the notice of the medical profession in the United States through the publication of an article on that subject by Dr. M. C. Jennings, of Chicago, in 1896, and again in 1898<sup>4</sup>.

The medicinal virtues of the hawthorne, however, were first made known to the profession through an Irish physician, Dr. Green, of Ennis, County Clare, and who died in 1894.<sup>6</sup>

Dr. Joseph Clement<sup>6</sup> claims that crataegus oxyacantha is a sovereign remedy for angina pectoris.

Dr. Thomas F. Reilly, professor of applied therapeutics at Fordham University Medical College, read a paper<sup>7</sup> on this subject before the A. M. A. in June, 1909. He quotes the history of many cases to whom he had administered this drug, and states "in a few cases of non-compensating valvular disease, with symptoms in which there is an idiosyncrasy to the use of digitalis, it has afforded decided relief. \* \* \* \* Crataegus is essentially a mild cardiac tonic. It is perfectly safe and has no poisonous effect. It can do no harm in aortic disease, and it is worthy of a trial in these troublesome cases. In fatty degenerations and in heart lesions associated with high arterial pressure it should be a useful agent."

Jennings, in his first paper, states his conclusions from its use in over forty cases, that "it appears to influence the vagi and the cardio-inhibitory centers, and diminishes the pulse rate. \* \* \* \* The entire central nervous system seems to be favorably influenced by its use; the appetite increases and assimilation and nutrition improve, showing an influence over the sympathetic and solar plexus. Also a sense of quietude rests on the patient, and he who before its use was cross, melancholic and irritable, after a few days of its use shows marked signs of improvement in his mental state."

Strange as this last statement may appear, from actual experience I have been able to verify the marked sedative effect of crataegus upon the general system. Among

the books referred to the writer has found the following statements about crataegus.

The United States Dispensatory<sup>8</sup> merely gives two lines to this drug as follows: "The unripe fruits of the various species of crataegus or hawthorne, especially the crataegus oxyacantha (English hawthorne) are used for their astringent and reputed cardiac properties."

The American Dispensatory<sup>9</sup> has an article by Dr. Feltner, who writes "It is a curative remedy for organic and functional heart disorders, including cardiac hypertrophy, with mitral regurgitation from valvular insufficiency, and angina pectoris."

Fyfe's (Eclectic) Materia Medica<sup>10</sup> mentions the indications for giving crataegus to be "cardiac neuralgia; palpitation; intermittent pulse with increased rate; extreme dyspnea on slight exertion, usually accompanied with pain in the cardiac region; valvular deficiency, with or without enlargement. Crataegus is a remedy of great power in both functional and organic wrongs of the heart. In angina pectoris and in valvular deficiencies most wonderful results have been obtained from its exhibition after the failure of some of the best known heart remedies."

Further references were also found attesting the beneficial action of crataegus in Ellingwood's *Therapeutist* written by Dr. Ruff<sup>11</sup>, and Dr. R. W. Sharp.<sup>12</sup>

Since my own attention has been brought to the effectiveness of this drug, I have had considerable personal experience in its use, and have prescribed it in several cases, always with good result. The preparation which I have used has been the specific tincture of crataegus oxyacantha manufactured by Lloyd Bros., of Cincinnati.

Histories of a few of the cases treated with this drug follow:

albumin; urea, 7 grains per ounce, and no casts. She was ordered to rest in any position most convenient to her comfort, and to take tincture of digitalis, five-drop doses, in combination with crataegus, ten drops, every four hours. Also to take a tablet of glonoin, 1-200 grain, whenever attacks recurred. April 17, the patient states that she can now lie down in bed without distress, using only one pillow. To-day she walked to my office (a distance of eight blocks from her home) without suffering the former discomfort. Her blood pressure registered 220 mm. and pulse is 90 per minute. There is still slight tachycardia, but the heart sounds are normal. Digitalis increased to ten drops and crataegus to fifteen drops four times daily. April 28, continues to improve. May 9, reports that she "feels fine," and is doing her own housework and has had no further attacks. Urine free of albumin; blood pressure, 215 mm., and pulse 86. Advised that she should continue taking crataegus alone in fifteen-drop doses four times daily. July 22, heard from patient through one of her family, who reports that she has gone to the country, and that she still takes crataegus but has not had an attack since last noted.

*Case V.*—Mrs. G., aet. 45; has been suffering from tachycardia, arrhythmia, double mitral murmur and aortic stenosis. Her pulse ranges from 90 to 190 beats per minute. She has complained of "palpitation and heart pains" for over a year, noticeable upon the slightest exertion; her appetite is poor; constipation, and occasionally headaches. Sometimes dyspnea is present and at such times she is unable to assume the recumbent position.

She was advised to relinquish all work, and lie down as much as possible. Codeia, digitalis and strophanthus were given to her to ease the pain and regulate the heart action. Castor oil was administered as needed to maintain good bowel action. While the pulse rate was lowered, the pains and other discomforts would make themselves manifest upon the slightest exertion. January 6, 1916, I began to use crataegus in her case; first giving it in ten-drop doses every four hours, and gradually increasing it up to twenty-drop doses. March 27, she reports only slight distress upon walking, and is able to perform light household duties. She

is also now able to sleep in bed with her head low. The double mitral murmur is still heard; her pulse is 90 (after having walked to my office); and general improvement in her physical condition is noticeable. Gave a chalybeate tonic in addition to continuing the crataegus. May 11, improvement continues. June 5, patient shows great improvement in her appearance, and states that she suffers from no discomfort at present, although she has walked to my office from her home after having worked at ironing clothes for over an hour. Pulse, 78; heart murmur very faint, and patient has gained over five pounds in weight.

*Case VI.*—Mrs. J., aet. 57; has had frequent mild anginoid attacks for more than a year. Examination shows an intermittent pulse at irregular intervals; rough systolic mitral murmur; blood pressure, 175 mm., systole, and pulse 78-90. After taking crataegus a few weeks the angina disappeared, and the pulse became more steady and regular. Her son, a physician, reports that she continues to improve, and is only taking the crataegus; also that while formerly there was a slight albuminuria, this has now disappeared.

From the foregoing cases we can see that crataegus oxyacantha acts as a valuable sedative and regulator of the heart and blood vessels. It is the writer's belief that it acts mainly through its influence upon the inhibitory nerves of the heart, and thereby through the entire vaso-motor system. It does not increase blood pressure by stimulating the heart, but seems, on the contrary, to establish an equilibrium between the heart and the blood vessels; thus regulating the blood pressure and reducing it if it be too high. It likewise slows the heart action, without having any depressant effect.

As Dr. Reilly has stated<sup>14</sup>, "its action is non-poisonous," and it can be given without fear of digestive disturbance, as it is very agreeable to the taste. The action of the drug is slow unless given in large doses; but I think it wiser to give the drug in

steadily increasing dosage until the desired effect is obtained, and to maintain that dose for an extended period, which should be determined by the results.

It is well to note that occasional doses of digitalis in combination with the crataegus adds to the efficiency of both drugs, especially is this true if there is any nephritic involvement, or considerable cardiac dilatation. Transient albuminuria is a frequent concomitant of the symptom complex of angina pectoris, and in all my cases this has either disappeared entirely, or has been greatly lessened after the exhibition of crataegus.

Diet should also be carefully considered. A limited protein dietary in the plethoric cases, with a more liberal one to those who show evidence of anemia, is desirable.

Withdrawal of the proteins will often cause a shock if the supply is reduced too radically, and a marked feeling of exhaustion follows, reacting badly upon the patient.

High proteid poisoning is like any other stimulating systemic poisoning, and is best dealt with by a gradual diminution until proper conditions are approximated. The proteins of some foods seem to have a more energetic or poisonous action upon the economy than that of others. Each individual also apparently has a personal idiosyncrasy, and it is necessary to study this factor as no general rule will suit all cases.

Every patient who is subject to anginoid attacks should be taught to study himself with reference to the articles of diet which most readily "agree" with him; not those which taste best nor those which he craves. The physician can aid by supplying the patient with a suitable diet list, of sufficient caloric value, but of lower proteid content

than that which the patient formerly indulged in.

Thus, with proper food supervision; moderate exercise; regulation of digestive and excretive functions; normal sleep, and mental occupation without exhaustion, supplementing the exhibition of crataegus oxyacantha we will go a long ways toward effecting a marked amelioration of the conditions which tend to cause angina pectoris.

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## SOME CONDITIONS OF MEDICAL PRACTICE.<sup>1</sup>

BY

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AND

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The conditions of medical practice are of vital medical and social interest. They concern not merely the individual physician and his patient but society at large. Various social complications increasing the difficulties of medical practice have arisen, in part through the faults or desires of physicians,

<sup>1</sup> Read before the National Conference on Community Centers and Related Problems, New York City, April 21, 1916.

in part from the demands of patients, and very largely through the environment and conditions beyond the control of either.

It must be realized that the resources available for maintaining health or combating disease are distinctly limited among families whose income forces them to live below the standard of living deemed requisite for the maintenance of health. To quote from Chapin, the Standard of Living in New York City, "An income of less than \$800 does not permit expenditures to care properly for the health of the family."

It must be remembered that, according to the Census of Manufacturers for 1905, Bulletin 93, Bureau of Census, only 26.3 percent of wage workers earn over \$15 a week. Assuming that the responsibility for the support of families belongs to the male, the seriousness of income is at once apparent, in that only 20.4 per cent. of male wage earners of over 16 years earned more than \$15 a week. Among women wage earners over the age of 16 years, only one per cent. are to be found in the income groups above \$15 a week.

It is patent that large portions of communities must naturally be forced to seek medical aid from sources other than private practitioners. Hence, the wide development of the dispensary system. In the United States today there are over 750 dispensaries and out-patient departments for the care of the sick. Of this number, approximately 400 are general dispensaries and 300 limit their field of activity to the care of tuberculosis, and the rest are dispensaries for special diseases as those of the eye, ear, nose, throat, etc.

Regardless of whether this development has been due to interest in medical education or to the rapid growth of the public health movement, it cannot be denied that

the rising cost of living has been a tremendous factor in creating this medical machinery. Of the 400 general dispensaries, 62½ per cent are out-patient departments of hospitals. Of 160 institutions studied by the committee on out-patient service of the American Hospital Association, 23 at least received over sixty thousand visits a year.

The City of New York is unusually rich in hospital and dispensary facilities as well as in medical colleges. These facts make the practice of medicine in the City of New York a matter of severe competition. In considering the present condition among general practitioners, one must divide them into three distinct classes. The first includes the physician with the hospital connections, the second, the physician giving regular service at a dispensary but without any hospital appointment, and the third group represents the doctor who is not connected with either hospital or dispensary. From the standpoint of medical practice, social value, and scientific service to patients, there are wide variations among these three groups.

Since some medical men become attending or consulting physicians to more than one hospital, it is well to consider what advantages accrue to an attending physician or surgeon at a hospital. In the first place, there are distinct commercial advantages. He possesses more or less permanent tenure in his position and as a result may develop his practice through the advantages of hospital facilities. He does not lose his private patients who require hospital attention but may place them in his hospital and thus continue to treat them. Similarly, inasmuch as only hospital physicians may treat private or ward patients in most of the hospitals of the city, he cultivates a natural growth of his practice through the patients of physicians less for-

tunately situated who, perforce, turn over their cases requiring hospital care to him for attention. It is obvious that by reason of this association he must necessarily gain a reputation that leads to the development of consultation practice enabling him to raise his fees. His general standing in a community is enhanced by virtue of his position, and to the laity he becomes a prominent medical man. All of these elements contribute to his commercial success without any great expenditure of energy, because within the hospital it is possible to see many patients in a short space of time, to call upon whom in private practice might require an entire day.

On the scientific side, he has the opportunity of enjoying for himself, and of utilizing in behalf of his patients, laboratory facilities of all kinds. The special examinations of blood, urine and sputum, the microscopical investigation of tumors, and the use of the X-ray are all at hand to aid him in arriving at an accurate diagnosis. This contributes not merely to his personal advantage but still more to the welfare of the patient and thus to society. He possesses unusual facilities for keeping up to date in modern medicine. He is constantly in an atmosphere of medical learning and may, indeed must, continue to develop his diagnostic acumen and therapeutic technic. Not only is he a student, but he is a teacher engaged in training young medical men who form the interne staff.

The medical material available on his service forms the basis of scientific investigations which, in turn, supply abundant data for his scientific presentation either before medical societies or in the medical press. The difficulties of medical practice do not exist for him except as he bids for consultation work without giving unethical rebates

to the struggling practitioners who are thus trafficking in patients.

The second group only connected with dispensaries, do not enjoy such marked commercial advantages nor as great scientific rewards. They have the opportunity of enlarging their professional acquaintanceship and possibly of making individual connections such as emergency assistants to more active men longer in practice. Occasionally, there may be the legitimate reference of a patient to his office, not by himself, but by the registration clerk who sees in an applicant an individual not entitled to free dispensary treatment. These opportunities for medical growth are exceedingly limited. We know, unfortunately, that some clinic physicians abuse their privileges and for a possible fee take the risk of referring patients to their own office.

On the scientific side, they have the opportunity of specializing in some particular branch of medicine which appeals to them. They may gain a rich experience by reason of the large amount of clinical material existent in most of the clinics. Further, by this system of reference within the general clinics, they may learn much of other branches of medicine by referring obscure cases to special departments for particular examinations. Men of an unusual potential ability may impress their fellow workers and in a sense secure a wider experience through clinic consultations. Such procedures tend to enhance their medical reputation but do not necessarily add to their commercial welfare. In many of the dispensaries, the clinical assistants have a stimulus for further scientific work through opportunities for teaching students. For those so inclined, the scientific material of the clinic is available for utilization through presentation to medical societies or by serv-

ing as the basis of an article to be published.

The advantages or disadvantages of dispensary treatment to patients is not the subject assigned to us for discussion. The large question of dispensary abuse would undoubtedly have to consider the abuse of patients in dispensaries because of lack of time, inadequate facilities, and monotony of service.

The most important group includes the general practitioner who is in no wise associated with a hospital or dispensary system. For him the struggle for existence is by no means a simple matter. He possesses no special commercial or scientific advantages in his isolation. His scientific attainments must be secured at the expense of his patients. His general knowledge can only be enriched through attendance at medical meetings or through reading the medical journals. Perchance, if money is available, he may take advantage of a post-graduate course in some subjects appealing to his interest. Relatively barren as are his scientific possibilities, equally so are his commercial opportunities. Being ethical in his ideals, he seeks to eke out an existence by adding to his income in any legitimate way that may be open to him. He frequently limits his own advantage and makes conditions of medical practice more difficult not only for himself but for his equally unfortunate colleagues. With the unethical or criminal malpractitioners, we are not immediately concerned. Their financial success is more easily achieved.

Let us assume that a young physician is well educated, a graduate of an excellent medical college, and even that he has had the advantage of hospital training. He arranges for a modest office, purchases on the installment plan the necessities of equipment, hangs up his little sign, and awaits

the patients who are to be of service to him financially as he is to be of service to them medically. Who are to be his patients? The large proportion of the population now cared for by others must contain his future clientele. Competition for practice is keen. It is not a question of medical ability, nor wholly of fees. The public has no criterion for good medical service. In addition to the large number of men similarly placed, he is combating numerous private, public, independent, and organized institutions for the care of the sick and the well. He may add to his income by securing a position as a medical examiner for an insurance company or by finding a position through civil service examination in some branch of the city service.

There is the lodge doctor who is the paid medical attendant of some lodge. The lodges pay their physicians about one dollar per year for each single man and two dollars per year for each married man. The average number of members of these lodges is, possibly, 120. Lodges with memberships of 300 engage two doctors. In order to gain a living, some physicians aiming at large practices may serve as many as thirty lodges and the average is probably somewhere around six to eight lodges. Their services are purely medical and exclude obstetrics and surgery. Their quasi patients do not hold them in high esteem, and most frequently when serious illness is at hand do not depend upon the lodge doctor but send for a "regular doctor." With the underpayment and the large clientele it is obvious that their examinations of the sick are too frequently hurried and superficial. The more modern resources of the laboratory are not utilized. It is poor service for poor pay. In a sense, the lodge members get just what they pay for. Meantime, the lodge serves as

a training school, and a poor one, for its doctors.

A second competitor is to be found in the doctors of the workingmen's circle and the fraternal orders such as the Foresters of America and the Woodmen, or Odd Fellows. The advantages and disadvantages of lodge doctors hold true, the other benefits may be developed for this physician because he must be a member of the fraternal order.

The third type of competitor is to be found in the mutual aid organizations. These are growing more common and are found particularly in connection with the establishment of social work for employees in factories and large corporations. While the scientific returns are negligible, the financial gain is more satisfactory and may run from \$2.50 to \$5 per annum for each member of such mutual aid association. The patients themselves receive, in general, better medical care, though in many instances, the physician acts in the interest of the employer in order to safeguard his position by retaining favor.

The most unfortunate type of competitor, particularly from the standpoint of the patients, is the medical institute which is a purely commercial institution. Anyone may join a medical institute and by the payment of 5 to 10 cents a week is supposed to be assured of medical attendance in case of illness. Unfortunately, almost any illness requiring careful attention carries with it the necessity of an extra charge. Thus the patrons of such institutes are exploited financially and medically and do not secure the adequate treatment which they believe they will receive by virtue of their weekly payments.

In addition to these types of institutions, many hospitals maintain district physicians who are paid varying amounts per annum

up to one thousand dollars. They minister to the poor patients applying to them within their districts by direct visitation or through reference from the hospital or dispensary. The patients dependent upon this class of attendance enjoy one advantage when hospital care is required, for the district physician promptly sends them to the institution he represents. The patients themselves are not charged for the service of the district physician. Many municipalities where hospital facilities are not numerous maintain district physicians who are paid by the municipality.

A generation ago, the young physician as well as all others had abundant medical opportunities in the care of infantile diarrhea, diphtheria, and the other diseases of infancy and childhood. The establishment of milk stations and the institution of pre-natal care have decreased the infantile morbidity rate so that these old sources of medical revenue have largely disappeared and thus the field of medical practice has been markedly limited. While this has been of tremendous social benefit and is thoroughly approved of by physicians, it has nevertheless decreased their opportunities for securing a livelihood through the practice of medicine.

It is patent that the new ideas of public health have stimulated the board of health activities. Today, the special clinics for tuberculosis, genito-urinary diseases, diseases of the eye, nose and throat, etc., care for many of the patients formerly dependent upon private attendants. The rapid improvement of diagnostic laboratory facilities for the examination of urine and blood, for bacteriological and serological examinations has advanced the medical and social welfare of this city, but at the same time has deprived many young medical men of the

benefits of making examinations of this character. Not content with the hospitals and dispensaries, the health department has realized the richer meaning of modern medical service and is instituting health centers where, without cost, people may be instructed in the art of keeping well. Thus again the number of available patients in the community is very properly being decreased, but as a result the conditions of medical competition are being made more difficult.

One must not forget the valuable hospital system of this city, from the general hospitals with in-patient and out-patient service, and some indeed with their corps of district physicians, to the special hospitals such as maternity hospitals, orthopedic hospitals, babies' hospitals, etc. Many of these maintain large out-patient services in addition to their wards and private rooms and extend their wise help on the district basis. Many avail themselves of the services of student or post-graduate men and women who virtually become special medical apprentices and are enriching their medical and social potentialities. They too are all limiting the sphere of service of the general practitioner.

When clinics were operated only in the daytime, the evening office hours gave some slight promise of medical practice, but now the night clinic, made available for industrial workers, has come into existence and another section of possible medical practice has been assumed by public and private philanthropic medical agencies. As though these institutions were not sufficient to discourage the neophyte in medicine, there has grown up the practice of having special physicians, with or without pay, to care for the welfare of the inmates of special institutions, such as day nurseries, homes for

the aged and infirm, orphan asylums, sanatoria, convalescent homes, etc.

It is obvious that the conditions of medical practice are exceedingly complex. The average income of doctors is by no means high. The actual data are difficult to obtain, but it has been variously estimated that the average annual income of physicians varies from \$800 to \$1200 a year. Of course, the public is usually startled into believing that medicine is an overpaid profession by hearing of the fabulous fees that are occasionally charged by some unusual practitioners. The great proportion of the profession is struggling for existence, financially, scientifically, and socially. The compensation acts which are at present calling for public action will probably be a factor in improving the scientific, social and economic status of medicine and of practitioners. If this conjecture be correct, it is to be welcomed.

From this brief resumé of the circumstances attending medical competition today, it is manifest that the life and success of the average practitioner are attended with many difficulties. The standards of medicine are not as high as they should be. The character of service offered to the general public is below the highest types of practice available, though higher than formerly. The very rich and the very poor, as has been wisely said, have the advantage of the best type of medical service. The great middle class now dependent upon physicians with modest equipment, lacking sufficient laboratory facilities, deprived of the practical advantages of continuous care for their patients, is not securing medical justice. The difficulty will not be solved until medical competition gives way to some form of medical cooperation. Whatever form this may assume, it must be directed

along lines equally benefitting the medical profession and the afflicted public.

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## WHAT DO WE KNOW ABOUT POLIO-MYELITIS?

BY

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Notwithstanding the voluminous literature on the cause of infantile paralysis, and the fact that it is of worldwide distribution; has prevailed as an epidemic since 1905 in Europe from Scandinavia to the Mediterranean, from the British Isles to the Danube; in North America from Alaska to Alabama, from the Atlantic to the Pacific; in the West Indies, in South America, Australia and in the South Sea Islands, an etiology has not yet been determined. Skilled bacteriologists and laboratory workers, teachers, men eminent as clinical observers and authors have expressed themselves with more or less clearness of opinions based upon theory, but the offending agent, whether a bacterium or a toxin is as elusive as ever.

(1) It is stated that the virus is found in the tissues and secretions of persons who have died of the disease and in the secretions and washings from the rectum, and that these secretions were infectious to animals, causing identical complaints in them. No figures are available from which one can base a judgment as to the probability of those having recovered from infantile paralysis being carriers of the disease in the same sense as those recovering from typhoid; nor are we able to demonstrate a living virus outside of the human body; at least reports making such claims are not convincing.

(2) The avenues through which the virus may enter and cause infection are drawn from inferences after experiments made upon the lower animals—monkeys are

said to be susceptible to infection when the secretion from those suffering from the disease is injected into the brain, peritoneal cavity, the general circulation or subcutaneously; by rubbing the virus into the nasal mucous membrane and in the case of monkeys through the stomach tube. It has been claimed that infection may come through the *stomoxys calcitrans* (the ordinary biting fly) and the bedbug. But these claims have not been accepted as conclusive.

(3) The disease has been in evidence for some years during every month of the year in the latitude of the northern United States although reaching a maximum during the summer and autumn, reaching its minimum during spring and winter months. In this respect differing in its epidemiological character from the more commonly known infectious diseases such as scarlet fever, measles, diphtheria, whooping cough, etc., which are more prevalent during the spring, late autumn and winter.

(4) Poliomyelitis, it would seem, has been epidemic for a number of years in every large city of every state in the United States, although trustworthy statistics are not available. Recent epidemics can not be ascribed to the introduction of a new infection, as the disease doubtless prevailed sporadically for some years in cities before it assumed the menace of an epidemic. There are essential differences in the characteristics of the disease in separate localities where epidemic poliomyelitis prevails taking the character in certain instances of altogether different diseases. A fact to be taken into consideration is that during the epidemic in New York City in 1907 it extended to distant New England, while in nearby Philadelphia with its daily interchange of residents it did not prevail. Again in 1908, 9 and 10, the disease became epidemic in Minnesota, Nebraska, Iowa and Kansas justly regarded as sequelae to that in New York City and surrounding territory of 1907. Chicago through which practically all traffic from New York passes, escaped. Another example is that the disease occurred as a rather severe epidemic in Washington, D. C., and an outbreak at the same time in Philadelphia in 1910, while Baltimore, directly between the infected cities escaped with only sporadic cases.

(5) Unlike the bubonic plague, yellow fever, smallpox and other epidemics of some

years ago, but a small percentage of the population where poliomyelitis prevails as an epidemic are attacked. Epidemics seldom attack more than one in one thousand of the population of 100,000 inhabitants. The epidemics are self-limited, declining within a few months and as a general rule do not recur in the same locality for at least two years. This decline does not appear to be due to exhaustion of the sources or vehicles of infection, nor entirely upon seasonal conditions. It may be due to the exhaustion of susceptible material, (or why not to lack of further supply of the virus?).

It has been observed as a very general rule that epidemics are more intense in small towns and rural localities than in large cities. This proportional greater rural prevalence has been so constant as to be due unmistakably not to chance but to some fundamental law.

(6) A close study of epidemics has shown that the incidence of poliomyelitis is proportionately about the same among those living under good or bad hygienic conditions. Children under 5 years of age, furnish from 50 to 90 per cent of the cases; adults constituting over 50 per cent of the total population seldom furnish more than 10 per cent, usually a very much smaller proportion. This would indicate a greater susceptibility of children under 5 years of age; and observation does not show that children are more exposed to infection than are adults. Infants unquestionably partake of more milk than adults or even of youths, and this fact has been considered by some the source of infection. Wickman reported a small outbreak of infantile paralysis where the evidence pointed to infection through a common milk supply. The spread of this infection is thought to be independent of overcrowding, improper feeding, personal uncleanliness and the presence of vermin.

Another suggestion is that the incidence of this disease appears proportional to the number of domestic animals present.

It has been shown that of 2,070 persons exposed to poliomyelitis by residence in the same houses, only 14 or 0.6 per cent developed the disease. This would indicate that

the disease is very slightly contagious. Similar evidence of slight contagiousness is shown in the small incidence among large groups of children exposed by association in schools and institutions with acute cases. The conclusion therefore may be fairly definitely arrived at that poliomyelitis must be slightly or rarely transmissible through either the respiratory or gastrointestinal excretions; also that recognized cases must be relatively unimportant sources of infection.

The seasonal prevalence of poliomyelitis corresponds in a general way to that of typhoid, especially to the rural typhoid and the residual typhoid of cities with good water supplies; and more closely to the prevalence of infantile diarrhea and enteritis.

In view of the above facts obtained mainly from *United States Public Health Service Bulletin* No. 350, July 14, 1916, we have not made any appreciable progress towards the control of epidemic poliomyelitis, notwithstanding researches, clinical and laboratory, made by our ablest minds, including the distinguished members of an advisory committee called together from all parts of the United States. The disease remains as mysterious as it was before the committee convened; while the disease was left to exhaust itself with the aid of time, segregation, hygienic measures and lack of a defined knowledge of treatment.

A careful scanning of the published list of new cases and deaths reported from day to day in Greater New York, discloses the cases to be located mainly in the poorest sections of the city and principally those of foreign parentage, where the milk supply is of the poorest grade, "C," not pasteurized, and of questionable age. As the great majority of children under 5 years of age receive daily more or less of this milk whether breastfed or otherwise, why not forbid the

sale of unpasteurized milk for a sufficient time to determine whether poliomyelitis is a milk born disease like typhoid, scarlet fever and some of the other infectious diseases or not. Sooner or later a filterable microorganism may be found, possibly a ptomain or toxin resembling the alkaloids which would pass the filter unchanged. Such a substance might be found having a selective affinity for the nerve and brain tissues similar to the alkaloid strychnia, but with different physiological characteristics.

#### SUMMARY.

1. The cause of poliomyelitis is unknown.
2. There are no statistics available to justify the claim of carriers.
3. No bacterium or toxin has been demonstrated.
4. Avenues of infection are claimed from inference because of experiments on lower animals, especially monkeys.
5. Infection through flies, bedbugs or other insects not in evidence.
6. Seasonable characteristics. The disease prevails during every month of the year in northern United States, the maximum being the summer and early autumn, the minimum, the spring and winter months. Its prevalence corresponds in a general way to that of typhoid, especially rural typhoid and the residual typhoid from rural sections carried to cities with good water supply; more closely to the prevalence of infantile diarrhea and enteritis.
7. Contagious. Nearby cities do not suffer while sections remote acquire the disease. Only 14 of 2,070, or 0.6 per cent of those exposed acquired the disease; recognized cases relatively unimportant source of infection.
8. Age. Children under 5 years of age furnish from 50 to 90 per cent of the cases; adults 10 per cent or less. 1 to 1,000 of population of 100,000.

9. Diet and Hygienic Conditions. Wickman reports outbreak when evidence pointed to infection through a common milk supply. Incidence proportionately about the same among those living under good or bad hygienic conditions.

## POLIOMYELITIS—ITS TREATMENT WITH INTRASPINAL INJECTIONS OF CONVALESCENT HUMAN SERUM.<sup>1</sup>

BY

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An unusual opportunity was afforded during the past summer to study and compare various therapeutic measures in poliomyelitis. At the beginning of the epidemic we were handicapped by having practically nothing beneficial at our command. The efficiency of drug treatment, especially the antispasmodics, bromide and chloral, was nil. Scientific observers like Flexner proposed the internal administration of urotropin on the theory that formalin can be found there after in minute quantities in the spinal fluid. Later Meltzer suggested the use of adrenalin based on a series of physiological experiments and proposed the intraspinal injection of adrenalin in 0.5 c.c. (1-2000) doses to relieve or prevent paralysis. The use of organotherapy had been suggested, but careful clinical observations on a large scale have not been made until recently.

Various forms of serum therapy have been advocated, thus for example, the injection of sterile horse serum, various antitoxines, and antimeningitis serum, also the subcutaneous injection of spinal fluid withdrawn by aspiration from the patient. All of these have been credited with a few successes, but the large majority of cases either died or became paralyzed.

<sup>1</sup> All the serum used was furnished by the Research Laboratory of the New York Health Department, through the courtesy of Dr. Wm. H. Park and Dr. A. Zingher. I am also indebted to Dr. Josephine Neal of the Meningitis Laboratory for many examinations of spinal fluid which aided in making the diagnosis in doubtful cases.

There is one form of serum therapy which has proven of great value during the past summer. I refer to the use of blood serum taken from a convalescent poliomyelitic case, be it child or adult, a recent case or one of previous years.

Human serum contains antibodies which have great therapeutic value. There may be other virtues in the serum. In a series of cases in which the pre-paralytic symptom (tremor) existed, the paralysis was prevented. This occurred in at least ten of my cases. In like manner bulbar symptoms with marked dysphagia and inability to speak, associated with intense rigidity of the sternocleidomastoid and rigidity of the extremities improved within 12 to 24 hours after one or two intraspinal injections of convalescent human serum.

In a series of cases in which the children were comatose with extreme rigidity, with frequent tonic and clonic convulsions, and in which the prognosis was fatal—the temperature ranging between 104 and 105 degrees and which had persisted for days, dropped three to four degrees, as if by crisis within 12 to 24 hours after one injection of human serum. The specific effect was so striking that I would not feel justified in refusing to give any case, no matter how hopeless the prognosis, at least one injection.

A typical case seen was one of a child about four years old which had a series of convulsions recurring, and a very high temperature. The prognosis was fatal. When seen by me the child had had convulsions, was in deep coma and rigid. Lumbar puncture yielded 25 c.c. of spinal fluid. An injection of 15 c.c. human serum was given. A gradual improvement took place, and the child has completely recovered.

The cases are usually seen in one of two

stages—the febrile stage, or in the paralyzed stage. The febrile stage usually lasts from three to five days—rarely longer, and it is during this fever that we can modify or prevent paralysis.

The large majority of children are first seen in the paralyzed stage. The earlier symptoms such as fever, lassitude, muscular pains, irritability and a preparatory tremor or twitching had been overlooked. A large number of these cases belonged to the laboring classes, hence minute symptoms were frequently overlooked. It is therefore of great importance to have the publicity officer of the health department disseminate through the daily press, the early symptoms frequently met with so that cases of poliomyelitis can be recognized in their incipiency. After the paralytic stage has been reached, treatment is much less successful.

**The Diagnosis.**—The diagnosis of poliomyelitis depends upon grouping a series of symptoms such as gastric disturbance, frequent vomiting, fever, muscular pains, marked hyperesthesia, and muscular twitching of the face, arms or legs, while awake as well as when asleep. Such twitching recurs at intervals of various seconds and depends on the degree of toxicity. Colliver of Los Angeles and Netter of Paris have described this twitching and called it a pre-paralytic symptom. Very many observations made by me and by other physicians have confirmed the value of this symptom several days before paralysis occurs. This symptom of twitching in addition to the presence of fever marks the time in which serum therapy, by the intraspinal method is most efficacious.

The reflexes were exaggerated, in others they were completely lost. The patellar reflex in one case was lost for almost two months, while the plantar and cremaster

both could be elicited. The Babinski and the Kernig were usually present, so also the tache cerebrale. In most cases there was spinal rigidity and a painful cry when attempting to rotate the head. There was also rigidity of the sternocleidomastoid. Older children complained of pain between the 5th and 7th cervical vertebrae. They also complained of headache, and pains in the knee-joints. When the above symptoms presented themselves with or without vomiting, a lumbar puncture was made and 15 to 20 c.c. of spinal fluid aspirated for an examination. When a strong Fehling's reduction, an increase in the mononuclear cells, in the albumen, and in the globulin was reported, the case was regarded as positive.

In very many cases I did not wait for the laboratory findings, but immediately injected 15 c.c. of convalescent serum intraspinally, through the same needle left *in situ*. The earlier the serum was given, the better the result and it is because I insisted on the early administration of the convalescent serum, I believe, that we have prevented many cases of paralysis.

Still more striking in effect was the intraspinal injection of a series of cases of bulbar paralysis, some of these considered hopeless. Out of ten such cases injected there was but one death.

**Serum Treatment.**—In a study of twenty-five cases seen in consultation with twenty-five physicians all of whom recognized the gravity of the cases, every case recovered, with one exception, a case of bulbar poliomyelitis. All of these cases received from 10 to 15 c.c. of the serum. One advantage in the patients' favor was the fact that the cases were seen early, usually during the first three or four days, in some cases on the day of onset. Some of these

cases are still under observation and will be published later.

**Method Used.**—With the child in the dorsal position, knees flexed, head brought well forward to separate the laminae of the vertebrae, an area around the 4th and 5th lumbar vertebrae was cleansed with soap and water, then tincture of iodine applied. With the aid of a sterile needle the spinal canal was punctured and 15 to 30 c.c. of spinal fluid withdrawn. When the fluid spurts under great pressure 45 to 60 c.c. should be withdrawn. Through the same needle left *in situ* 15 c.c. of serum from a convalescent case of poliomyelitis should be injected by the gravity method. One injection of serum is usually sufficient although the same dosage may be repeated in twenty-four hours and a third injection in forty-eight hours if no improvement is noted.

**Reaction.**—A severe febrile reaction frequently follows the intraspinal injection of human serum. In some instances nausea and vomiting followed. Opisthotonus is occasionally noted soon after the injection and gradually disappears as the serum is absorbed.

**Intraspinal Saline Irrigation.**—I have used intraspinal irrigations of normal saline solution at a temperature of 105 to 106 degrees in a series of cases with excellent results. Several moribund cases responded promptly to this form of treatment. The needle is introduced between the 4th and 5th lumbar vertebrae and as much as possible of the spinal fluid withdrawn. Thirty to 100 c.c. have been withdrawn at one time. Thirty c.c. of saline solution is then injected. After redraining another 30 c.c. of the saline solution is injected. This is repeated three times. After the third drainage, 15 c.c. of convalescent blood serum is injected, the needle withdrawn, and the puncture sealed.

with collodion or medicated adhesive plaster.

In the bulbar type with extreme prostration and coma where it was impossible to feed by mouth, I have used injections of warm saline solution 250 c.c. every four to six hours by hypodermoclysis. In one case of coma with inability to swallow, the child received 250 c.c. of saline solution in the loose cellular tissue of the abdomen with excellent result. Hot saline colonic flushings or the Murphy drip at a temperature of 105 to 106 degrees were given to supplant the hypodermoclysis.

Muscular rigidity accompanied by pain is best relieved by warm sulphur baths. The crude sulphuret of potassium, four ounces to a tub bath of water at a temperature of 103 degrees will frequently relax the body and promote sleep. In some cases it will be found necessary to prolong the bath to 15 or 20 minutes to produce the effect. These baths should be given morning and evening for at least one week.

The intraspinal serum treatment does not contraindicate the internal administration of from 3 to 5 grains of chloral hydrate when necessary to induce sleep. It may be repeated every two hours until effectual.

155 West 85th Street.

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**Vaccine Treatment in Whooping Cough.**—Gerstenberger (*American Journal Diseases of Children*, October, 1915) reports on the results of the vaccine treatment of whooping cough with a vaccine of the etiologic organism. The results were generally successful; superior to those obtained from drugs. He emphasizes the importance of early diagnosis and the value of prophylactic inoculation. The action of the vaccine is most marked during the catarrhal period of the disease. Spasmodic cough was relieved and general suffering lessened.

## HEALING BY MAGIC AND MUMMERY (OR "MEDICAL MAGIC AND MUMMERY.")

BY

R. I. GEARE,  
Washington, D. C.

Having its origin, it is believed, among the ancient Magi of Medea, Persia and neighboring countries, the supposed production of supernatural effects through magic art was based on the theory that all finite things were controlled by certain natural forces capable of preserving and destroying them. It thus followed that any who could master these powers could dispose as he chose of all that was subject to them. The magic art, however, was not confined to the eastern countries, for among the North American Indians, South Sea Islanders and other savage or semi-savage races of the Occident, medicine-men have abounded who were supposed to possess marvelous powers for curing disease. They are even now treated with great respect by their own people and form an exclusive society with endless privileges. They are the worst kind of fakirs. For instance, they pretend to suck poison from a patient's body or cough up an arrow point or small pieces of stone or bone, which they make believe have been transferred from the patients to them by the evil spirit of another sorcerer. The Eskimo medicine-men pretend to be able to prolong life indefinitely and excuse their own mortality on the ground that when members of their class die it is because they have been overcome by some stronger medicine-men. They profess to be able to change themselves into stone or wood, to walk on the water or to fly, but they cunningly make the proviso that no one may be allowed to see them do it!

An Eskimo healer rubs the seat of his patient's disease, blows on it and then pretends to withdraw his hand with the greatest difficulty, as though he were extracting a heavy load of pain. At the same time he looks upward, rolls his eyes and groans. Then he

healers and in the efficacious properties of certain natural objects prepared by them. All they had to do was believe and their faith cured them! Stones, such as the turquoise, have for ages been endowed with divine attributes, and by their means men,

FIG. 1. Indian doctor's magic rattle.

throws the disease violently away and, breathing again more freely, demands immediate payment of an exorbitant fee!

Perhaps it is not so very astounding after all, that ignorant people of all races should have been easily lead from time immemorial to believe in the curative powers of magic

birds, beasts, fishes and plants were made to grow and bear fruit.

Certain magical stones, it was believed, enabled one to discover any person in any part of the world, as well as to understand the language of birds and beasts, while the "angelicall" stone (a charm attributed to

Elias Ashmole of London, in the middle of the 17th century) was supposed to endow its possessor with divine gifts, causing angels to become manifested, besides conveying the power of conversing with them through dreams and revelations.

plant called "kouchi," but regarded as a drug of marvelous power by pharmacists in Europe no further back than the 16th and 17th centuries. In some parts of China, it is still regarded as a supernatural means of renewing youth.

FIG. 2. Dried lizards are highly esteemed for medicine in China.

There is almost no end to the variety of charms, talismans and amulets in which people of Oriental countries still believe. One is the so-called "scythian lamb," known in China as the "golden-haired dog," actually nothing more than the woolly root of a

Elias Ashmole, above mentioned, who styled himself "Mercuriophilus Anglicus," in his praise of alchemy described several classes of stones, such as "mineral" stone, "vegetable" stone, "magical" or "perspective" stone, etc., and declared that the first

had the power of changing any imperfect earthy matter into gold and silver, flints into rubies, diamonds, sapphires, etc. Even such men as Lord Bacon and Sir Isaac Newton speculated on the Philosopher's Stone, which was about on a par with those of our day who visit mediums and believe in slate writings and spirit rappings. It is a fact, too,

gold, which will contribute more than anything else to prolong life, which at present is poisoned by the oxides of copper, lead and iron, which we daily swallow with our food." (Perhaps there is something in that).

Magical powers were commonly believed to be bestowed through the medium of animals. Toads and some other kinds of ba-

FIG. 3. Indian doctor (masked) treating a patient.

that Dr. Christopher Girtanner, a famous professor of Göttingen, prophesied as late as the last century that before it had passed, the transmutation of gold would be generally known and practiced. "Every chemist and artist," he wrote, "will make gold; kitchen utensils will be of silver and even

trachians came under this category; hence lizards which have been dried and stretched on bamboo splinters are still greatly in demand in China and other countries where the primitive medical-man yet holds his own.

In some parts of Japan, the mere skin of a snake is still supposed to be a sovereign

cure for pains in the abdomen. Turtles are regarded with great awe in China and elsewhere, and so too are tigers' bones and carbonized monkeys' skulls, which latter are prepared by putting them into clay vessels

disgorged, form a most invigorating tonic for the sick.

The exorcising of disease by a host of gods and goddesses is still credited in some parts of China, Japan, India, Korea, etc.

FIG. 4. Shinto priest (Japan) selling prayer charms of magic potency.

exposed to heat until the crania are thoroughly calcined. Birds, too, are carbonized for medicinal purposes, while the nests of certain swallows, made out of the gelatinous substance of seaweeds partly digested and

For example, the Hindoo goddess who had a personal power over smallpox is approached with solemn ceremonies and presents to propitiate her. She is represented as standing with two uplifted fingers,

threatening to strike on the right and the left. Before her stands a band of the executors of her vengeance, two of them with red grinning masks, black shields and naked scimitars. White lines, like rays, issue from the bodies of others, to indicate infection. On the right is another group of men with spotted bodies inflicted with the malady. Bells are hung at their girdles. These men are preceded by musicians with drums, who

calling the attention of the deities to the need of their exercising sacred powers in behalf of the sick and unfortunate.

Akin to this kind of blind faith is the credulity of some classes of Japanese, whose doctors know very little more about anatomy and physiology than do their patients, and for purposes of diagnosis they rely mainly on the pulse; three of which they say can be found in each wrist; namely, the heart,

FIG. 6. Scythian lamb.

supplicate the pity of the furious deity. From behind, advances a bevy of smiling young women, gracefully carrying on their heads, baskets with thanksgiving offerings, in gratitude for their lives and beauty having been spared. By such means the goddess is at last induced to stay her fury, and the diseased are cured (or supposed to be—which appears to have answered just as well).

In Java, idols are provided with bells for

controlling the right upper pulse; the lungs, the left upper pulse; the stomach, the right middle pulse; the liver, the left middle pulse; the right kidney, the right lower pulse; and the left kidney, the left lower pulse. By examining these six pulses the healer at once pretends to discover what ails his patient and proceeds to effect a cure, or at any rate, to make him believe that he is cured!

What else is all this but another applica-

tion of the power of a stronger mind over a weaker one, as taught by our Christian Science friends?

The vanity of women proved valuable to the magic healer in old England. If disfigured by warts, they were simply told to steal a piece of beef from the butcher's shop, rub the warts with it, bury it, and (*presto!*) the warts disappeared. If they wanted their complexions to be more pink,

proved the inefficacy of the alleged remedies, the people should have gone on believing in them; but had it not been so, human nature would have been different from what it was, is and probably always will be.

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## "TEACHING AND PRACTICE."

BY

BEVERLY ROBINSON, M. D.,  
New York City.

In the admirable presidential address with this title, delivered before the Biennial Medical Congress at its last meeting in Washington, by Dr. William S. Thayer, the great value of mature judgment in the practice of medicine is not mentioned.

To my mind and especially to-day, I know of nothing quite equal to it, when we consider fairly the well-being of the patient. Between all the experts in their different specialties, the patient is not, or rarely can be, entirely well. Almost invariably there is some flaw in his bodily make-up that requires treatment. Too often this treatment is over refined and undue attention is paid to minor ailments of little importance, when the whole organism is properly considered. No one has higher esteem than I for accurate scientific work in medicine, as shown, notably at Johns Hopkins University by its distinguished professors and associates. I claim, however, and rightly, as I believe, that no scientific teaching can take the place in the practice of medicine, of that insight and sympathetic doing, which are the special prerogatives of the older practitioner. He has had frequent contacts with and cared for all usual complaints of suffering men and women.

FIG. 6. TALISMANS (Arabic, *tilsam*: magic image)—Small silver images of the whole or parts of the body, representing by form or attitude painful or diseased organs. These images are often hung in the churches in some countries, either as votive offerings after restoration to health, or as a material part of an invocation or appeal for divine aid.

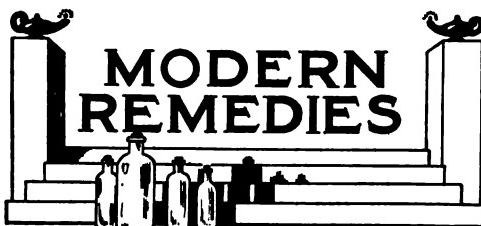
all they had to do was to eat some kind of plants, seeds and all; shortly after which roses took the place of sallow skin. In Algeria, women still follow this practice, using a plant called "fenugreek" for the purpose.

The wonder of all this kind of thing is that after countless failures must have

The result is that he is able fully to meet and help knowingly, various symptoms as they arise. The sooner this fact is again brought home to students and daily taught the better it will be both for future doctors and patients. The most gifted professor rarely cures disease. As a rule he simply relieves symptoms as far as may be and prevents in some instances disease from becoming more serious. It is the ceaseless, untiring watching and doing of the general practitioner which attains best results. He is thoroughly familiar with the individual patient and knows his peculiarities as regards medicine, food and habits. This knowledge is what is most essential in the treatment and occasional cure of disease in its ever varying aspects.

**Neurotic Arthritis.**—The characters which distinguish neurotic arthritis from gouty and rheumatic inflammation may be tabulated thus, says the *Practitioner*:

1. It is rarely, if ever, accompanied by fever.
2. It comes on after or with paralysis, and affects only partially or entirely paralyzed limbs.
3. The bones are tender on pressure below the point of spinal lesion.
4. The articular swelling is due to a synovial effusion and periarticular exudation, which fixes the patella if the knee be affected.
5. It is accompanied by a doughy edema of the limbs, and cutaneous and muscular atrophy.
6. The treatment for gout or rheumatism utterly fails to afford relief.
7. If the spinal trouble be not sufficient to produce death, the joints are completely restored to functional activity, the pain and edema first disappearing, then the paralysis, and last the thickening and stiffness of joints.



Conducted under the Editorial Direction of Dr. John W. Wainwright.

**Nitrous Oxide in Obstetrics.**—Frederick C. Irving, (*Boston Medical and Surgical Journal*, March 30, 1915), concludes an interesting article on the above subject as follows: Nitrous oxide and oxygen is the most successful analgesic known for the relief of the pains of labor. It is the safest anesthetic there is. It has no untoward effects, immediate or remote, upon either mother or baby. It does not delay labor or in any way impair the efficacy of the uterine contractions. It is pleasant to take, and recovery from it is extremely rapid and usually featureless. It can be administered anywhere, and it can be employed by any physician who will take his confinement cases seriously enough to retain a capable assistant for its administration.

**Diet in the Treatment of Diabetes Complicated by Nephritis.**—Stark (*Medical Record*, June 3, '16) discusses the treatment of those suffering simultaneously from diabetes and nephritis. In this very interesting and instructive thesis, the author brings out a very important point in connection with the loss of weight while on a restricted diet. We quote from Dr. Stark's paper: "Regarding the aim of Allen to keep the patient below weight and under reduced metabolism, it would appear that this effect is automatically accomplished by the natural ravages of the disease itself, without subjecting the patient to the heroic treatment of fasting. My experience has been, that a confirmed diabetic before he comes under treatment will lose weight at a rapid pace, and while he may improve materially under observation he rarely reaches the level of weight that marked his era of health. This rapid emaciation and

failure to regain his original highest weight admonishes us that there is a real danger in underfeeding patients who are naturally disposed to emaciation and denutrition. This inclination of diabetics to overfeed and thus overload their digestive organs and overcharge their organs of metabolism must be combatted. Feeding is not so much a question of how much is ingested, but how much is digested.

The influence of diet upon this association of diseases is very changeable. The renal and cardiac functions require constant watching. The amount of urine voided is no longer a reliable index, since the natural course of the nephritis may produce a diminished amount, which will be marked by the increased amount due to the diabetes. In the same way the specific gravity is unreliable. The blood pressure curve is valuable in determining the relative importance of the two diseases. When a diabetic voids less urine than he usually did, has headaches or is drowsy, has an increasing blood pressure, an accentuated aortic sound, an increasing albuminuria, his nephritis will require more attention than the glycosuria. On the contrary, if the patient show no steady rise of blood pressure, no cardiac hypertrophy, no evidence of arteriosclerosis, the glycosuria will require attention. The ideal to be sought in this form of cases is avoidance of a ketonuria. In a patient advanced in years, in whom an acidosis can be kept in abeyance, the glycosuria need not be regarded seriously.

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**Magnesium Sulphate in Tetanus.**—Robertson (*Archives of Internal Medicine*, May, 1916) declares that the use of magnesium sulphate is indicated in the treatment of tetanus as proven by results in the past ten years, especially during the present European war. It is evident from reports that antitetanus serum is a valuable agent in the treatment of all cases of tetanus whatever the incubating period may be, as well as magnesium sulphate by intramuscular injections, the latter having brought about a definite, even though small decrease of deaths, as well as undoubted diminution of the agonizing suffering which accompanies the spasmotic seizures. In 29 cases collected from published reports in

which magnesium sulphate was given subcutaneously, the mortality was surprisingly low, much lower in fact than in cases when it was given intraspinally. Robertson expresses a conclusion that the intravenous use of this agent has proved disappointing in so far as its influence on the final outcome of the disease is concerned, while there is unquestionably greater danger to the patient where intravenously given. A rapid injection of concentrated solution magnesium sulphate may cause sudden death from cardiac or respiratory paralysis. The author concludes that magnesium sulphate is of greater value in the treatment of tetanus than chloral or other narcotics. It must, he writes, be used boldly to secure best results, which fact necessitates a constant watching of the patient. Rapid stimulation may become necessary. He regards it the attendant's duty, in addition to the use of antitoxin serum, to endeavor to control or relieve the pain and secure the patient's rest by subcutaneous use of magnesium sulphate.

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**Paraffin Dressing for Wounds.**—Berroye (*Lyon Médicale*, May, 1916) reports the use of a mixture of paraffin and petro-latum to spray on wounds and declares that it affords protection to wounds without injury to the tissues; and as dressings applied over the spray do not adhere, there is more prompt healing of the lesion. The mixture can be medicated if desired. It can be used without fear of infection from the hands when dressings are applied and is, in his opinion, an ideal dressing for superficial wounds or lesions, burns, etc. as well as deep seated wounds, which should be thoroughly cleaned and drained. The mixture reduces pain and promotes healing. As the paraffin mixture is raised by the accumulated pus below, it is lifted, so there is no danger from an accumulation of excretion.

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**Salt Solution and Paraffin for Wound Dressings.**—Gonbaroff (*Presse Médicale*, May 18, 1916) reports a treatment in which he cleanses the wound as usual and flushes it with isotonic salt solution. It is then thoroughly rinsed with 8 to 10 per cent solution of salt, leaving a small quantity in the wound; rubber drains are then fitted,

and the wound packed with gauze impregnated with liquid paraffin. The latter prevents adhering of the gauze while the isotomic salt solution promotes a copious discharge. Results were more favorable than under any other treatment or technic with the possible exception of exposure to direct sunlight.

### Radium Treatment of Various Surgical Conditions.

Dr. Joseph B. Bissell presented to the Medical Society of the State of New York, Saratoga Springs, May 16-18, 1916, (reported in *The Medical Record*, June 3, 1916) his experiences with radium in 100 nonmalignant cases. He thought that the stimulating rays might be of service in bone necrosis. One patient had radium applied for 20 minutes and six times to a bleeding corn. The callosity dried and dropped off. Ten milligrams cured another corn previously cauterized and incised without relief. Mrs. C. had 25 milligrams applied to uterus for fibroid, causing tumor to decrease in size and to make operation unnecessary. Lady, 47 years old, had a fibromyoma, the size of an orange, for which radium was applied in 50 milligram doses three times. She experienced rises of temperature and pulse, and backache; later she developed cystitis; but eventually the fibroid had decreased to a small nodule. A keloid on the neck disappeared after 15 milligrams for 30 minutes and (after one week) 25 milligrams for 10 minutes. Radium softened a scar from a razor wound of the cheek after a 20-30 minute application. Two applications removed the discharge and granulations from an amputation stump following the removal of a toe osteomyelitis. He reported two infected knees similarly relieved by the use of radium, and believes that the present results in bone cases justified more extended trial.

recovery of patients with uterine and vaginal cancers. In early and good operable cases, the use of radium combined with operation adds greatly to the chance of recovery without a recurrence. The most remarkable fact about the radium treatment of uterine and vaginal cancers is that it often clears up those cases which have extended too far locally and become firmly fixed to the pelvic wall; in other words, cases which are utterly inoperable. We have had 327 cases, including borderline cases, cancer fixed to the pelvic wall, great massive cancers choking the pelvis, and many in which there were general metastases and the radium was used to bring relief alone. Over 20 per cent of this group have apparently been cured. In a large number of those who were not cured, the discharges stopped, pain ceased, and health was built up.

**Antitetanus Serum.**—Robertson in the *American Journal of Medical Research* (June 1916) reviews the work done with antitetanus serum and the various methods of employment. He favors an intravenous injection of one dose of 3,000 units. The serum, he declares, remains in the circulating blood for a period of one week, long enough to determine the result of most cases of tetanus. He thinks the serum should be injected at once or as soon as possible after the first symptoms of the disease appear, as every minute counts in the final results. He also believes the immediate intravenous injection the most important and the dose the least important point in treatment.

**Calcium Sulphide in Mercuric Chloride Poisoning.**—Wilmus, (*Lancet Clinic*, May 13, 1916) reports a case of mercury poisoning. The patient, a man, having taken seven and a half grains of the bichloride. Fourteen hours after ingestion he was given seven and a half grains of calcium sulphide dissolved in seven and a half ounces of boiled and filtered water by intravenous injection. The patient had practically recovered in two days. Pyorrhea alveolaris developed, but this was soon controlled by calcium sulphide given by mouth.

**Radium in Cancer of the Uterus and Vagina.**—Howard A. Kelly and G. F. Bur-nam, Baltimore, reported to the American Gynecological Society, (*Journal American Medical Association*, June 17, 1916) state that the use of radium in sufficient quantities greatly enhances the chance of permanent

**Adrenalin in Epidemic Poliomyelitis.**—

The most recent recommendation for the administration of adrenalin is in the treatment of poliomyelitis, and several preliminary notes suggesting its use in the epidemic still present in New York City, have appeared in the medical journals and newspapers.

It is altogether too soon to pass judgment upon this measure; but it appears that intraspinal injections of the 1:1000 adrenalin chloride solution, undiluted, exert a salutary influence on the course of this disease in many cases.

This new treatment, first suggested by Dr. S. J. Meltzer of the Rockefeller Institute, consists in injecting as much as 2 mils. (120 minims) into the spinal canal, and repeating this every six hours. Beneficial results are said to have been brought about, the most notable clinical change being the gradual reduction of the intraspinal pressure and with it the disappearance of some of the severe symptoms. It seems quite probable that the increased pressure of the spinal fluid is partly responsible for the paralytic and motor disorders. Lewis (correspondence in the *Medical Record*, July 29, 1916, p. 202) reports that some cases have regained voluntary movement of various parts following this treatment.

Meltzer (*Journal Am. Med. Assn.*, Aug. 8, 1916, p. 461) notes that more than fifty babies received an intraspinal injection of 2 mils. (c. c.) of the 1:1000 solution every six hours from the beginning of the disease i. e. 8 mils. or about two drams "for many days without the slightest harm." The slow absorption from the spinal canal is evidently responsible for the lack of serious systemic effects following such seemingly heavy dosage.

In the *New York Medical Journal* (Aug. 5, 1916, p. 286) Max Talmey describes such persistent treatment on so-called humane

grounds, although he states that one injection may be tried. Whatever the outcome of this method, it is at present receiving extended trial and despite the psychical disadvantages of the necessary intraspinal injections into small children, it will likely be found that such considerations are not to be compared to the dire results of the disease.

**Parathyroid Therapy in Paralysis Agitans.**—

Mention of the prospective value of parathyroid medication in the treatment of paralysis agitans has already been made in this department (AMERICAN MEDICINE, April, 1915, p. 254) and the recent reference to this subject by Berkeley (*Medical Record*, July 15, 1916, p. 105) is sufficient excuse for referring to it again. As a matter of fact this is the only satisfactory treatment of this disease, since the use of active sedatives like hyoscine is merely obscuring the manifestations, and not lessening their incidence.

In his latest paper, Berkeley reiterates his faith in this method and advises a daily dose, preferably by injection, of one-fiftieth of a grain of an acetic acid extract of fresh parathyroids from bullocks. The preparation made by Perry, of New York and, perhaps, erroneously called "nucleoprotein," is the one employed by Berkeley. It is quite without local effects and 15 minims of the solution does not even redden the skin if properly injected.

Experience with several hundred cases warrants the conclusion that this is a rational method of treatment, though it is far from a "cure." Perhaps 60 or 70% of the sufferers who have given this remedy a trial for from three to six months have received great benefit, the progress of the disease being arrested or very materially retarded.

One of the cases mentioned by this writer was an elderly man, who had taken the capsules and occasional series of hypodermic injections for seven years. He is still in fairly good condition—a really remarkable thing in Parkinson's disease—and relapses into helplessness within a few days when the medicine is omitted.

Berkeley concludes his paper with the following frank statement, which his clinical experiences with this method makes possible: "I am still of the opinion that paralysis agitans is caused by a deficiency of the parathyroid glands, and that further and more diligent study of the complicated chemical processes involved will make it ultimately possible to cure paralysis agitans with parathyroid in just the same way in which cretinism is cured with thyroid."

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C. A. L. Reed and others, and (c) it usually causes other symptoms in epilepsy which have been definitely attributed to hypothyroidism.

2. The study of epilepsy from the standpoint of the glands of internal secretion is rational.

3. Thyroid therapy is a rational therapeutic adjunct in epilepsy accompanied by other signs of hypothyroidism.

4. Favorable results from the use of thyroid extract in epilepsy should be considered as a confirmation of these conclusions.

It is not intended to convey the idea that this is a cure for epilepsy, but rather to emphasize the fact that the thyroid gland, because of its intimacy with detoxication and metabolism in general, deserves to be considered in the investigation of every case of epilepsy; and where one finds evidences of waning thyroid activity, thyroid therapy may be instituted with other rational treatment and a better percentage of results be attained.

In a paper published almost simultaneously Dercum (*Journal Am. Med. Assn.*, July 22, 1916) speaks also of the value of thyroid therapy in epilepsy. He states that in a given number of cases the physiological level of the patient may be distinctly raised by the administration from time to time of small doses of thyroid extract, say from an eighth to a quarter of a grain three times daily. Thyroid in small doses, long continued, stimulates the chain of glands of internal secretion, increases oxidation and promotes metabolism generally.

Sajous (*New York Med. Jour.*, April 1, 1916, p. 627) supports this view in the following statement: "Of the neuroses epilepsy is the most prominent. L. Pierce Clark, whose vast experience in the study of this disease is well known, states that: 'The two predominating lines of advance in recent years are the hereditariness of the disease, and disorders of metabolism due to perversion of the internal secretions of the ductless glands'—precisely what I (Sajous) had pointed out five years earlier."

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**Thyroid Extract in Epilepsy.**—The following conclusions are made by Harrower (*Lancet-Clinic*, July 29, 1916) and amplified by numerous quotations from the literature:

1. Thyroid insufficiency is likely to be a frequent underlying factor in the etiology of epilepsy for several reasons: (a) It favors toxemia; (b) it produces cellular infiltration and edema which may affect the brain in the manner described by Hertoghe,

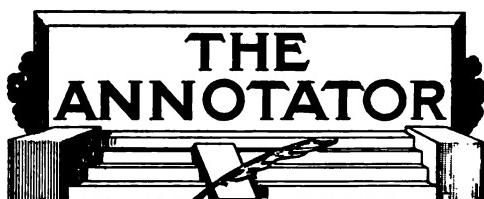
**Pituitrin in Acute Intestinal Paresis.**—Colton (*Buffalo Med. Jour.*, July, 1916) reports the remarkable results of a single

injection of pituitrin. A woman with double pneumonia was evidently dying as the result of the extreme pressure upward of an over distended and tympanitic abdomen. Breathing was greatly embarrassed and the blood pressure had fallen 40 mm.

One-half a mil. of pituitrin was slowly injected into the median cephalic vein. The result is best told in the writer's own words: "Within thirty seconds there was the most remarkable effect I ever witnessed on a human being, the expulsion of large quantities of flatus with a large liquid stool that nearly filled the bedpan. In less than three minutes the abdomen was in a normal condition"—and the patient recovered.

**Pituitary Treatment of Hyperthyroidism.**—Pal reports 16 cases of exophthalmic goiter and hyperthyroidism (*Deut. Med. Wochenschr.*, Dec. 23, 1915, p. 1,537) which were treated with subcutaneous injections of posterior pituitary extract. While such medication seemed to exert no influence in cases with normal thyroid functioning, as soon as this became excessive, a pronounced and beneficial action was noticed. Occasionally the thyroid may increase slightly in size, but the symptoms subside meanwhile. Three of the above cases were of the severest type and could not be operated upon because of the extreme weakness; but after a series of injections of pituitary they were then successfully operated on.

One experience was unfavorable. A man of 44 with arteriosclerosis and symptoms of exophthalmic goiter was treated as outlined and the symptoms improved but simultaneously vascular spasms developed. Treatment was stopped but local gangrene ensued and later death from myocarditis. Pal warns against the use of pituitary in weak heart with arteriosclerosis. In fact, great caution must be observed constantly with the use of pituitary as the individual response to the dosage varies widely and at the start the amount given should be small, say 5 to 8 minims, daily or every other day, increasing to a half or even one mil. at each daily dose.



**Sterile Thermometers.**—Clinical thermometers have long been viewed with suspicion as a possible factor in transmitting infections.



In ordinary usage, there is undoubtedly some degree of laxity in cleansing the thermometer. The uncertainty of actual sterilization makes it difficult to be absolutely certain that sterilization is accomplished. The common practice is to wash the thermometer in water while applying friction so as to remove any saliva or exudate adhering to it. There are still some physicians who do not differentiate in the use of thermometers for taking temperatures by mouth and by rectum. Wherefore, the importance of cleansing thoroughly assumes even greater value.

There are some thermometer cases devised so as to contain solutions of alcohol, carbolic acid or formalin, the use of which greatly enhances the possibilities of thorough cleansing.

In the *Saint Paul Medical Journal*, July, 1916, Ramsey and Schoberg describe the results of making cultures from thermometers used by physicians in their daily practice and a few thermometers employed in hospital work. Of 82 cultures taken, 33 were sterile, while 49 contained various types of organisms. Streptococci, staphylococci, and pneumococci were recovered in some instances. Unfortunately, no cultural tests were made to indicate the virulence of any of the organisms, as a result of which the degree of infectivity remains unsolved. The fact, however, that organisms of these types are recoverable from thermometers is sufficient proof of the inadequate care given them. Thermometers that had been thoroughly washed with running water, with constant rubbing, and then washed with 95 per cent. alcohol all gave sterile cultures.

While these facts are by no means new,

it is well to again call attention to the possible source of infection from unclean thermometers. Very careful washing is all that is necessary, though greater safety results from a second washing with alcohol. This procedure is simple, requires but little time and withal is so important, that it can hardly be called unreasonable to demand this simple standard of thermometer cleaning. Experience has demonstrated that the degree of danger in the dissemination of disease from contaminated thermometers is exceedingly slight, otherwise infections due to this factor would have been so numerous as to have attracted the same degree of attention that has been called forth by typhoid carriers.

It would hardly seem necessary to demand a separate thermometer for mouth and rectal use at this late date in the history of the world, but there are always some who through indifference or neglect are careless about the esthetics of medical practice. In the endeavor to limit the spread of disease, the physician himself should set the example. Clean clinical thermometers certainly form part of the professional responsibility in the care of the sick and the protection of the well.

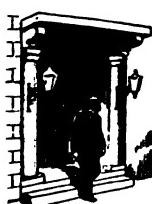
nomic principles involved to determine which individuals are entitled to secure dispensary service. As a result of his investigations he arrived at the conclusion that the extent of dispensary abuse as ordinarily understood is exceedingly small. At the Washington University Dispensary, where practical efforts are made to eliminate financially unsuitable patients, the abuse is not greater than 2 percent. of the total number of dispensary patients. This small percentage should be reassuring to the medical economist opposed to present dispensary methods.

It is obvious that general financial standards as criteria for conditioning attendance at a dispensary must necessarily be unsatisfactory and must fail as the basis for dispensary service to many of those actually needing it. The standard for single persons living alone essentially differs from the two sexes, while the monthly income of the individual having only himself to support must vary from the scale necessary for the welfare of a man supporting a family including one to five or more children. In addition to the question of income, dispensary officials must take cognizance of the nature of the illness and the probable cost of its efficient treatment, together with the influence of the illness upon the earning power of the individual.

In the case of dispensaries organized largely for teaching purposes, the financial suitability of patients may be properly subordinated to their educational serviceability. The minimum income below which an applicant becomes properly the subject of free treatment is hardly to be accepted as a basis for securing material for the teaching of clinical medicine. A teaching clinic must have bountiful resources for carrying out its educational work. This phase of dispensary activity is in its narrow sense scarcely to be viewed as philanthropic but in its larger significance is to be construed as a legitimate philanthropic activity in educating embryo physicians.

In so far as financial standards may be established at present, Veeder's basic figure of an annual income of \$800 for a normal family of five is certainly conservative as one entitling those with incomes below this figure to free treatment for any kind of illness. He regards all men living independently, steadily employed at labor, as en-

### The Evils of Dispensary Abuse.—Dispensary abuse in the minds of most physicians refers to the alleged practice of per-



sons financially able to employ private physicians seeking advice and treatment without cost at dispensaries. Ability to pay for medical services is wholly relative. One might be able to pay for the treatment necessary for removing a splinter and be unable to meet the attendant cost for reducing and treating a fracture or treating an ulcer of the stomach.

Borden S. Veeder (*J. A. M. A.*, July 8, 1916), presents a valuable study of Standards for Determining the Suitability of Patients for Admission to a Free Dispensary. Veeder's inquiry was made in Philadelphia, Baltimore, Cleveland and Boston, where he conducted a thorough study of the cost of living compared with total income and attempted to correlate the underlying eco-

titled to free treatment with a weekly wage of below \$9.50 a week, while women under similar conditions are entitled to free treatment with a weekly wage below \$8.75 a week. Men living independently but working in industries with much unemployment are to be accepted for free treatment if their weekly wage is below \$11, while women under similar conditions are entitled to similar free treatment if the weekly wage is below \$10 a week. With these basic considerations, there can be little difference of opinion.

At first thought, the incomes may be regarded by many as enabling people to pay for services without difficulty. The income itself is a valueless criterion except as it is related to the cost of living. From this point of view the figures do not appear to be too high but reasonable. Every worker is entitled to live with a standard of decency which enables him to maintain his self-respect and to protect the community from hazardous forms of parasitism.

For the time being our ideas regarding dispensary abuse must be recast after a consideration of the social and economic purposes of dispensary organization. The educational and the charitable considerations both merit new study. The socialization of medicine and the new ideas bearing upon modern medicine demand more conservatism in judgment as well as greater liberality in arriving at a proper conclusion as to what really constitutes dispensary abuse in the traditional financial interpretation of this term. The careful student of medical economics will not be led astray by the bogey term, dispensary abuse.

The liberal ethical spirit in the profession which enables physicians to receive gratuitous assistance from their colleagues in times of medical need should afford food for thought. How many physicians could actually afford to pay for the services which they secure from their professional brethren were the ethical altruistic impulses of the profession restrained? What standard of income in relation to social needs would physicians have to maintain in order to enable them to pay for the medical services which they receive, but which they do not regard as medical charity? The willingness to reciprocate by medical usefulness to colleagues does not impair the direct financial value of the help received. Nor does it

militate against assessing a fair estimate of the obligation created by services freely given. Appreciative gifts or an honorarium do not yield an equivalent economic return for the attendance of a colleague during illness of oneself or of any member of the household. This beautiful mutual cooperation is well established through usage and medical tradition. Omitting its immense importance as a matter of sentiment, it is not unwise to take cognizance of its economic phases. While physicians themselves are receiving gratuitous services without recognizing their financial value, it is difficult for them to abstractly realize and estimate the need of dispensary service among unfortunates obliged to live on low incomes. The problem of dispensary abuse patently is far less serious than is the need of dispensary patients for better, more efficient, more effective and more painstaking dispensary care and oversight.

**The Right of the Child to be Well Born.**—The increase in the divorce rate, the diminishing birth rate, and the detachment of women is regarded by some as an evidence of the decay of interest in parenthood. Children are growing as objects of consideration for scientific study and philanthropy but interest in them, in the sense of a desire for children appears to be decreasing.

It is well known, that children today have passed out of the category of family assets into that of family liabilities. If there be an interest in eugenics at the present time, it is certainly popularly based upon the idea of having the growing generation consist of fewer children but of better quality. The eugenic ideal is altruistic in its desire for race betterment.

Dawson, writing of *The Right of the Child to Be Well Born* (Funk & Wagnalls Company), discusses in a popular and forceful way the biological fitness for parenthood to which he adds the moral fitness, which

depends upon an enlarged conception of morality. "From the viewpoint of eugenics, that is moral which insures a better human stock and that is immoral which defeats in any way this great end of revolution."

In order to secure the biological and moral fitness, it is patent that educational training for parenthood must be organized along rational lines. Education to this end does not mean the entire sacrifice of romantic life. The enlarged intelligence upon the subject of eugenics will enrich and strengthen the feelings, while religion will function by cultivating worthier ideals of marriage and parenthood. The racial ideals to be created involve first, vitality, second, intelligence, third, technical efficiency, and fourth, morality and religion. If these ideals can be established among men, then there will be recognition of the instrumentalities guaranteeing the right of the child to be well born.

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**The History of Medicine.**—How few are the handy volumes dealing with medical history? How much rarer are those readable to the average practitioner whose interest is occasionally aroused only to be destroyed by some too heavy book of reference? Dr. Fielding H. Garrison modestly wrote an introduction to his *History of Medicine* (W. B. Saunders & Company). It is more than an introduction. It is an invitation which can with difficulty be declined. With clarity, literary grace, and the expression of a genial soul, he has fashioned a book that makes the reading of medical history a pleasure.

To review it briefly would be damning it with faint praise. Not to review it formally may appear to the unknowing as an indication of indifference to its worth. In a sentence, it is a student's book for students.

It is a broad, cultured exposition of the human values of medicine, beautified by a literary artist and embellished by illustrations and notes that illumine the text with definiteness.

Who were the successive owners of the gold-headed cane? What painters have represented insanity? Who first devised an alphabet for deaf-mutes? What are the leading medical names of Spain, Russia, Norway, Sweden, Denmark, and Japan? Imagine yourself an Arabian or Jewish

physician of the 9th century A. D. What would be your probable modes of thought and procedure in handling a medical case? Give the history of the seton in medical practice. Give the history of factory legislation in England.

Such questions as these do not aid in the daily practice of medicine but a knowledge of the subjects which they involve aids in cultivating the mind, dignifies every concept of medicine and raises a man above the common-place practices of an active life. To dip into such a stream of medical history is to be refreshed and relaxed.

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**The Influence of Joy.**—The joy of living is recognized and sought. To some perchance the psychological worth of happiness is a blank subject. In the realm of hygiene and therapeutics, organic happiness possesses tremendous power. The psychological phases of an emotion are to most persons limited to its physical expression. It is difficult to interpret the physiological mechanisms involved in any emotional state. The muscular contractions when external are noticeable while the contractions in the muscular fibres in the arteries and viscera escape attention and do not induce thought.

The effect of nervous impulses upon glandular secretion correlates all the functions of the body for the better or poorer health of the individual. The blush of shame, the tears of sorrow, the palpitation of happiness, the sweat of anxiety, the goose flesh of fear are results which are accepted as objective phenomena, but the reason or mechanism for calling forth these expressions is barely understood by those undergoing them.

"A chief characteristic of emotional events is the universality of their physical influence that is in the body." Laugh and grow fat has a physiological basis, and good humor is a food and a tonic in the sense that it permits better digestion and more vigorous assimilation.

The author finds the elements of at least ten factors involved in the state of joy indicating the fundamental importance of physiological activities in contact with happy life. Joy yields energy in part produced in the increased secretion of adrenum. Bodily nutrition is improved. Fatigue is less insistent while general bodily exercise and

the release of restraint on instinctive or habitual actions adds to the sense of rejuvenation. Not alone is nutrition influenced but the circulation is accelerated. "The body is the complete machinery for preserving the happiness of the individual."

Agreeableness and disagreeableness manifest their tonal effects upon the nervous system and help to generate the forces and impulses which are to carry ideas to practical fruition. The mental machinery works more easily. There is a satisfaction in living which grows out of joy. "Joy is food, not only a stimulant; it supports while it urges on." In its social and economic aspect, joy may be regarded as making and unmaking many institutions, just as its presence or absence beautifies or uglifies personality.

In the words of Dearborn in his inspiring book on *The Influence of Joy* (Little, Brown and Company):

"Gladness of effective permanence and degree is not a mere theory of the optimistic morning sunshine, but a thoroughly practical and practicable human attitude. The persistent will to be glad is at first a joy, to be sure, but soon nature makes of it a wholesome religion, almost a worship of humanity and thus a form of love to God; and

'Love that hath no beginning hath no end.'

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**A Plea for Rational Sex Education.**—When Prince A. Morrow, with his forceful pioneer methods, started the American movement for sex education on its way, there was a dearth of appropriate literature by American writers. As a monument to Dr. Morrow and with the royalties pledged to the cause for which he lived, *Sex Education* by Maurice A. Bigelow (The Macmillan Company) makes a strong appeal for popular recognition.

No longer are the sensational sides of sex education astounding and disgusting the intelligent public. An intelligent public opinion has recognized its normal place in the education of children and approval has been voiced at the reversal of the traditional policy of silence. The movement has assumed permanency, though the methods to be adopted and the literature to be utilized will undoubtedly undergo natural evolution. It has established itself as a permanent and essential part of education that will at least present adolescent individuals a basis for an intelligent choice between good and evil.

The problems of sex education include personal sex hygiene, a knowledge of the social diseases and the social evil and involve at least an attempt at understanding the reasons and excuses underlying illegitimacy, sexual morality, marriage and eugenics.

Bigelow has done justice to his subject, particularly in his answers to the criticisms of such opponents as Agnes Repplier, William H. Taft, and William H. Maxwell. His approach is naturally that of a biologist, but it is tinted with an ethical concept that robs biology of its materialism.

The absence of dogmatism, the clearness of his vision, and the constructive educational program which he presents makes the book unusually practical and helpful. There are moments of vagueness, which is not unnatural when an author writes concisely and does not aim to discuss every possible detail of his subject. The entire purpose of his volume is found in the first paragraph.

"Sex-education in its largest sense includes all scientific, ethical, social, and religious instruction and influence which directly and indirectly may help young people prepare to solve for themselves the problems of sex that inevitably come in some form into the life of every normal human individual. Note the carefully guarded phrase 'help young people prepare to solve for themselves the problems of sex,' for, like education in general, special sex-education cannot possibly do more than help the individual prepare to face the problems of life."

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**Fifty Years in Practice.**—To be a physician for fifty years is far less vital than to have truly lived for fifty years. James Tyson received a diploma permitting him to practice medicine in 1863. In 1910 he retired from the chair of medicine at the University of Pennsylvania. During all this time he was actively engaged in the problems of medicine. He spanned the years when clinical thermometers and hypodermic syringes were unknown to practitioners. The theory of antisepsis, the development of the science of bacteriology, the organic conception of immunity, the brilliant accomplishments of the x-rays, the differentiation of contagious diseases, and countless other momentous advances in medicine have passed in a panoramic way across the fields of his valuable service.

In his *Selected Addresses* (P. Blakiston's

Son and Company) he has presented pictures of his many sided activities. His life was indeed one devoted *non sibi sed toti*. The educator, the traveller, the physician, the organizer, are all manifest in the plain words and the simple naturalness so characteristic of the man. As indicative of his belief in preparation for a medical career, it is but fitting to quote the qualifications and attainments which he regarded as essential for the general practitioner. The following quotation will also suffice to indicate his delightful style and the general readability of the volume.

Having described the field of the general practitioner, we naturally come to consider his qualifications, and it may be that I will surprise you somewhat in what I shall include among these. A moment's reversion, however, to the numerous duties I have assigned him will make it evident that his attainments, to be commensurate, should be correspondingly broad. I have more in mind, too, than that his qualifications shall simply fit him for these duties, remembering that the object of life is something more than the simple fulfilment of duty, and that health, happiness, and enjoyment are a heritage to which the physician is as much entitled as other men. To this end I consider that the general practitioner should have the broadest preliminary culture attainable. Much more than the specialist would I clothe him with a broad general culture. I would have him college-bred or the equivalent of college-bred. I would have him able to at least read Latin, French and German, while if he chose to include in his preliminary education the now much-despised Greek, I should regard him as no less fitted to fill the important role I have set for him. I would have him well drilled in physics no less than in chemistry, for no one is qualified to understand the problems of physical diagnosis, as set by diseases of the circulatory and respiratory systems without a thorough knowledge of acoustics and hydrostatics, while with such knowledge their understanding is comparatively easy. Equally, too, would I have him versed in the natural sciences—botany, mineralogy, comparative anatomy, and zoology—a biologist in the broadest sense of the term; for through such attainments I expect to add to his pleasure as well as to his usefulness, to make his otherwise lonely drives and walks holiday excursions pleasurable and profitable. I would have him well-read in the standard literature of his own and foreign languages, the latter not necessarily in the original, but in the excellent translations which abound; for I acknowledge that the general practitioner has a limit to his capacity for attaining and remembering. On the other hand, I insist the more on his acquiring such knowledge before beginning practice, because, though he still may have time to enjoy it after entering professional life, he may not have time to acquire it. In a word, I would have him equipped with all that

will make him accomplished, ready, and versatile, with a view to his own pleasure and enjoyment, as well that he may appear the equal and even the superior of those with whom hemingles socially and professionally. He should be at least the intellectual equal of the most intellectual of his community, the man to whom young and old alike will go for information on subjects on which they are in doubt, as well as for treatment of their physical ills.

His addresses reveal him to be the type which he has so ably described.

#### BOOKS RECEIVED.

**The Influence of Joy.**—By George Van Ness Dearborn, instructor in psychology and in education, Sargent Normal School, Cambridge; psychologist and physiologist to the Forsyth Dental Infirmary for Children, Boston, etc. Boston. Published by Little, Brown and Company, 1916.

**History of Medicine, with Medical Chronology, Bibliographic Data, and Test Questions.**—By Fielding H. Garrison, A. B., M. D., principal assistant librarian, Surgeon General's office, Washington, D. C., editor of the "Index Medicus," octavo of 763 pages, many portraits. Published by W. B. Saunders Company, Philadelphia and London, 1913. Cloth, \$6.00, net; half Morocco, \$7.50, net.

**The Right of the Child to be Well Born.**—By George E. Dawson, Ph. D., professor of psychology, Hartford School of Religious Pedagogy. Published by Funk & Wagnalls Company, New York and London, 1912.

**Sex Education.**—A series of Lectures Concerning knowledge of sex in its relation to human life, by Maurice A. Bigelow, professor of biology and director of the School of Practical Arts, Teachers' College, Columbia University. Octavo pages 247. New York. Published by The Macmillan Company, 1916.

**Human Motives.**—By James Jackson Putnam, M. D., professor emeritus, Diseases of the Nervous System, Harvard University, consulting neurologist, Massachusetts General Hospital, Boston. Price \$1.00 net. Published by Little, Brown & Co., Boston, 1915.

**Character and Temperament.**—By Joseph Jastrow, professor of psychology, University of Wisconsin. Price \$2.50 net. New York and London. Published by D. Appleton and Company, 1915.

**A Manual of Infantile Paralysis with Modern Methods of Treatment, including reports based on the treatment of three thousand cases, by Henry W. Frauenthal, A. C., M. D., surgeon and physician in chief, New York Hospital for De-**

formities and Joint Diseases, and Jacelyn Van Vliet Manning, M. D., epidemiologist, Wisconsin, 1908. Epidemic Acute Poliomyelitis. Copiously illustrated with more than one hundred engravings. Nearly all original. Price \$3.00 net. Published by F. A. Davis Company, Philadelphia, Stanley Phillips, London, 1914.

**Hay-Fever—Its Prevention and Cure.**—By W. C. Hollopeter, A. M., M. D., LL. D., attending physician St. Joseph's Hospital; pediatrician to the Philadelphia General Hospital. Published by Funk & Wagnalls Company, New York and London, 1916.

**The Meaning of Dreams.**—By Isador H. Coriat, M. D., first assistant visiting physician for diseases of the nervous system, Boston City Hospital, instructor in neurology, Tufts College Medical School. Price \$1.00 net. Published by Little, Brown and Company, Boston, 1915.

**Surgical and Gynaecological Nursing.**—By Edward Mason Parker, M. D., F. A. C. S. and Scott Dudley Breckinridge, M. D., F. A. C. S., with 134 illustrations in text. Published by J. B. Lippincott Company, Philadelphia. Price \$2.50 net.

**Studies in Immunization Against Tuberculosis.**—By Karl Von Ruck, M. D., and Silvio Von Ruck, M. D. Published by Paul B. Hoeber, New York.

**The National Formulary.**—Fourth edition—By authority of the American Pharmaceutical Association, prepared by the Committee on National Formulary of the American Pharmaceutical Association. Published by American Pharmaceutical Ass'n.

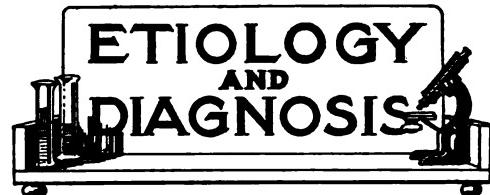
**Venesection—A Brief Summary of the Practical Value of Venesection in Disease; for Students and Practitioners of Medicine.**—By Walton Forest Dutton, M. D., illustrated with several text engravings and three full-page plates, one in colors. Published by F. A. Davis Co., Philadelphia. Price \$2.50 net.

**Practical Massage and Corrective Exercises.**—By Hartvig Nissen, with 68 original illustrations, including several full-page half-tone plates. Published by F. A. Davis Co., Philadelphia. Price \$1.50 net.

**Christianity and Sex Problems.**—By Hugh Northcote, M. A. Published by F. A. Davis Co., Philadelphia. Price \$3.00 net.

**The Treatment of Infantile Paralysis.**—By Robert W. Lovett, M. D., with 113 illustrations. Published by P. Blakiston's Sons, Philadelphia.

**A Text-Book of Practical Gynecology for Practitioners and Students.**—By T. Dod Gilliam, M. D., and Earl M. Gilliam, M. D., illustrated with 352 engravings, a colored frontispiece, and 13 full-page half-tone plates. Published by F. A. Davis Co., Philadelphia. Price \$5.00 net.



**The Value of Autoserum Injections in Skin Diseases.**—Gottheil, in the *New York Medical Journal*, (June 24, 1916), reaches the following conclusions:

1. In psoriasis the autoserum treatment, while not in itself curative, is an important factor in the treatment. It cuts down the time required for the troublesome local treatment from weeks to days, and enables us to promise to clear the skin in from two to five days in even the worst and most obstinate cases. It postpones relapses for a long time, possibly indefinitely. In most cases it so influences the type of the disease that the relapsing lesions are few and insignificant, and are readily amenable to mild local treatment.

2. In chronic urticaria, neurodermatitis, pruritus senilis, and other obstinate itchy dermatoses, it is worthy of trial. In some cases its action is effective and brilliant.

3. It is of some value in bad pustular acne; but in furunculosis, folliculitis, and other pus infections Gottheil has not found it useful.

4. In chronic eczema the same may be said as of acne; the injections are sometimes apparently effective, and at others fail entirely.

5. In pemphigus, lepra, and obstinate lichen planus it is ineffective.

6. In syphilis it is useless.

**Infantile Paralysis.**—Simon Flexner in his recent address before the New York Academy of Medicine on The Nature, Manner of Conveyance and Means of Prevention of Infantile Paralysis, reaches the following conclusions:

1. This is an infectious and communicable disease which is transmitted by diseased and healthy individuals. The virus leaves the body in the discharges of the nose, the throat, and the intestinal tract.

2. The disease attacks, by preference, young children and infants, and in caring for them the hands and clothes of adults may become contaminated. The adults may, in turn, infect other children. Cleanliness is therefore, the most important prophylactic measure.

3. The secretions of the nose and mouth are disseminated by kissing, coughing, and sneezing. Precautionary measures should be instituted to control these causes so far as possible.

4. Flies, which collect about the nose and mouth of infantile paralysis patients and even feed upon the intestinal discharges, carry the disease to unprotected food and to homes not protected by screens. Sick children should also be protected against the flies.

5. The early detection and isolation of the cases of infantile paralysis in all its forms and

the control of the households from which they come, will necessarily have to be the chief measures in staying the progress of the epidemic.

6. The degree of the susceptibility of children to this disease is less than to the other infectious diseases, as measles, scarlet fever and diphtheria.

7. The average death rate in many epidemics has been less than 10 per cent.

8. A larger number of patients than usually supposed recover completely. The paralysis may take as long as several months, and in some instances even years, to clear up. A very small number remain hopelessly crippled.

9. There is no preventative inoculation or vaccination. Recovery is accomplished by a process of immunization which takes place during the acute period of the disease.

nitrate of bismuth is harmless and may be employed.

The diet recommended by the author is indicated also in toxic gastritis, hyperchlorhydria, and after operations on the stomach.

**Ringworm of Hands and Feet.**—Ormsby and Mitchell (*Jour. A. M. A.*, Sept. 2, 1916) point out that the involvement of the glabrous skin surfaces of the hands and feet by ringworm is far more common than is usually believed. Since the lesions produced in these regions resemble closely several common dermatoses, the diagnosis must rest on the discovery of the parasite. Treatment is successful, but should differ according to the lesions. In severe purulent and eczematoid forms preliminary use of a soothing application of naphthalin with zinc oxide and starch should be prescribed, followed by application of a five per cent. solution of chrysarobin in a chloroform solution of gutta percha. Five daily applications of the latter are usually sufficient. If not, the treatment may be repeated after an interval of three days. In other forms chrysarobin alone may be used, or more prompt results may be secured from an ointment of the following composition:

R Acidi salicylici .....	2.0;
Acidi benzoici .....	4.0;

M. Unguenti simplicis .....	30.0.
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This may be used daily for several weeks, if necessary, without causing irritation.

**Treatment of Chancroid.**—Goubeau (*Presse médicale*, July 24, 1916) recommends the following treatment: The surface of each chancroid is first carefully freed from pus with pledgets of cotton dipped in ether. It is then painted, either by means of a camel's hair brush or a small rod around which a little cotton has been tightly wrapped, with the following preparation:

R Sodii arsenatis .....	1 gram;
Alcoholis .....	50 grams.

Misce.

The arsenate being relatively insoluble, the preparation is a suspension rather than a solution. The next step consists in causing the alcohol to evaporate rapidly by blowing air over it with a cautery bulb, bellows, or through a piece of straw. A thin film of sodium arsenate becomes deposited and penetrates into the recesses of the chancroid. Immediately after, the suspension is painted on again and again evaporated. Finally, a dressing of sterile gauze is applied. The treatment is repeated daily. Repetition for more than three or four days is rarely required. At the end of this time the chancroid is transformed into a healthy red wound which tends rapidly to heal. On each subsequent day the lesions are washed with ether and covered with powdered Iodoform. This treatment yields more rapid results than any other, a cure generally resulting in eight or ten days. Where bubo occurs as a complication, Goubeau obtains quick results by injecting directly into it, one c. c. of a one per cent. aqueous solution of so-



**The Dietetic Treatment of Round Gastric Ulcer.**—Iarotsky in a comprehensive article in *Roussky Vratch*, for June 4, 1916, expresses his earnest conviction that gastric ulcer can be completely cured by diet alone, but the diet must be sufficiently nutritious and yet be so bland that it does not stimulate the secretion of gastric juice. It must leave the stomach quickly and be digested largely in the intestines. Egg albumin, olive oil, or unsalted butter fulfills these requirements better than any other food. The whites of eggs not only leave the stomach rapidly, but possess the additional advantage of combining with the free hydrochloric acid which may be present. The whites of about eight eggs should be mixed with water (not beaten up) and given in the morning; and 160 grams of butter in the evening. This diet contains about 1,200 calories. No water or ice is given by the mouth, thirst being allayed by the use of enemas. To the latter may be added small amounts of sugar. The diet is kept up for ten or twelve days, when carbohydrates are added in the form of potato puree, with butter, rice, barley, or farina soup; later, fresh ground vegetables with butter. On this diet patients may be maintained for weeks and even months. This treatment, according to the author, allays pain, gastric distention, and eructations rendering the use of drugs unnecessary. The drugs usually employed in the treatment of gastric ulcer are worse than useless. Morphine, for instance, following a temporary inhibition, increases gastric secretion. Atropine has a similar action and, besides, exerts an undesirable systemic effect. Nitrate of silver, the old standby in the treatment of gastric ulcer, is distinctly contraindicated because of its stimulation of gastric secretion. Sub-

dium arsenate. This is repeated, if required, on alternate days. When an abscess forms, it is evacuated by puncture with a small trocar and the arsenate injected immediately after.

**The Girdle of Pregnancy—A Folk-Cure Relic of Early Times.**—McKenzie discusses folk-cures and refers in detail to the girdle of pregnancy which he says has an extensive distribution both in time and in space.

As is well known, the women of ancient Greece and Rome were in the habit of wearing a body belt or girdle during pregnancy, and the same is true of the women of Phoenicia, for the symbol of Astarte was a girdle. Assumed at the eighth month of gestation, and worn until parturition, it was then laid aside, for which reason one of the attributes of Artemis<sup>1</sup> in Greece and of the Roman Diana was "the girdle-loosener" (*Solvizone*). In later times the custom met with criticism, however, particularly from Soranus of Ephesus (A. D. 100), who recommended that it should be worn only up to the eighth month and then discarded, in order, as he said, that the weight of the child might aid in bringing on labor at the proper time.

The obstetric girdle was in universal vogue in Europe at one time. Mention is made of it in France in the days of Ambroise Paré, and we are still reminded of it in the French word *enceinte*, as well as in the German word *Entbindung*, which shows that the ancient Germans, like the Greeks and Romans, laid the girdle aside at the onset of labor. Naturally enough, the girdle came to bear a mystic or semi-sacred character, or it had that quality added to it. Thus, in mediaeval England the girdle of Abbot Robert of Newminster had the power of ensuring that women who wore it would have an easy confinement.

The Ossianic poems allude to a girdle which had similar properties, and there are said to have been in the North of Scotland obstetric girdles inscribed with mysterious figures which were preserved as heirlooms in certain of the old families. I do not know whether the girdle still lingers on in that part of the country, but in the Lowlands of Scotland and in England the practice seems to have died out.

In France, however, we hear of mystic girdles as being in use as recently as 1886. The sisters of St. Ursula, of Quintin, Côtes du Nord, "own one of the chief educational seminaries in Brittany. And when a young lady whom they have educated gets married and is about to become a mother the pious sisters send her a riband made of white silk, decorated by the

clever brush of the best calligraphist in the community with a beautiful inscription in blue letters. Before sending it off the sisters bring it carefully into contact with the reliquary in the parish church, in which is preserved a precious fragment of the very binder which the Holy Virgin herself wore, as a number of unimpeachable parchments clearly certify. The inscription in blue letters on the riband reads:—"Notre Dame de Délivrance, protéges-nous!" The young lady who receives the blessed riband is instructed to put it around her body in order that her accouchment may terminate happily."

Turning now to extra-European countries, we find the girdle in common use there also. That of Japan deserves a special mention. The first we hear of it is, strange to say, in an account of a Japanese Embassy to Rome (probably a fruit of the early Jesuit mission to that country by St. Francis Xavier) as far back as A. D. 1586, by a certain Guido Guetteri, a Venetian.

"As long as they are not pregnant," he writes, "the binder worn by Japanese women is large and easy, but as soon as they perceive that they are gravid they tighten up this bandage so forcibly with a string that one would almost expect them to burst. 'And yet,' they say, 'we know by experience that if we do not do so we have to endure a very severe labor.'"

The Japanese binder was strongly condemned by the reformer Kangawa, from whom we learn that it can be traced back in the historical records to about A. D. 1180. As a result of Kangawa's sensible opposition, the obstetric binder in Japan has now fallen into comparative desuetude.

The girdle is worn in China. And in Burma, as in ancient Rome, a tight bandage is applied at the beginning of the eighth month in order to prevent the womb rising, since the Burmese woman believes that the higher the child rises, the longer and more difficult will be the labor. Similar practices are reported as being prevalent among the women of Macassar, Celebes, Java, and Malacca, and also among the squaws of the Chippeway Indians.

Thus the origin of the girdle of pregnancy seems to lie, as we see from the more primitive instances, in the hope of preventing, by sheer physical force, the fetus from reaching a size so great as to impede labor. Magical restraint does not seem to be thought of in any of the instances I have so far encountered, but that a religious, as distinct from a magical, modification of the custom comes into play is no more than one would expect. Popular customs such as this was always do take on a religious cast after a time.

Every modern medical practitioner is of course acquainted with the "binder" which is applied after the child is born, in which respect it differs from the ancient girdle of pregnancy. In spite of this difference, however, it is not unreasonable to suppose that the puerperal binder of modern obstetrics may be the lineal descendant of the girdle of pregnancy.

<sup>1</sup> The Athenian women at their first confinement dedicated the girdle they had worn to Artemis, placing it in her temple.

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# American Medicine

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**Birth Control.**—In the *Boston Medical and Surgical Journal*, September 21, 1916, appeared a paid advertisement of the Massachusetts Birth Control League appealing to the physicians of that State in a fight against ignorance and prejudice. The particular fact calling forth the advertisement was an appeal against the sentence of a young man by the name of Allison to 3 years in prison because of advocating birth control. Among the specifications upon which he was tried was the distribution of articles which previously had been published in medical journals and circulated through the mails, apparently without violating the United States Postal Laws. In addition, he was accused of—and admitted distributing a pamphlet on contraceptive methods to a detective who represented himself to be a poor laborer with a large family.

It is natural that intelligent persons seeking to arouse public opinion on the question of birth control should seek to secure the opinion of the medical profession. It seems unreasonable to believe that the birth control movement is today within the category of subjects unfit for free discussion. The decrease in the birth rate is such that in 1900 there were only three-fourths as many living children to each one thousand potential mothers as in 1850, despite the fact that sanitary advances and environmental improvement had bettered the chances of living children to continue in life. The number

of children living under 5 years of each per thousand women of child bearing age, 15 to 49 years, had decreased in the Continental United States from 628 in 1850 to 474 in 1900. *Bulletin* 22 of the Department of Commerce and Labor Bureau of Census, discussing the proportion of children to potential mothers, quotes from the eminent John Shaw Billings at great length.

"It is probable that the most important factor in the change is the deliberate and voluntary avoidance or prevention of child bearing on the part of a steadily increasing number of married people, who not only prefer to have but few children, but who know how to obtain their wish. The reasons for this are numerous, but I will mention only three.

The first is the diffusion of information with regard to the subject of generation by means of popular and school treatises on physiology and hygiene, which diffusion began between thirty and forty years ago. Girls of 20 years of age at the present day know much more about anatomy and physiology than did their grandmothers at the same age, and the married women are much better informed as to the means by which the number of children may be limited than were those of thirty years ago. To some extent this may also be true as regards the young men, but I do not think this is an important factor.

The second cause has been the growth of the opinion that the abstaining from having children on the part of a married couple is not only not in itself sinful, or contrary to the usual forms of religious creeds, but that it may even be under certain circumstances commendable.

The third cause is the great increase in

the use of things which were formerly considered as luxuries, but which now have become almost necessities. The greater temptations to expenditure for the purpose of securing or maintaining social positions, and the correspondingly greater cost of family life in what may be called the lower middle classes, lead to the desire to have fewer children in order that they may be each better provided for, or perhaps, in some cases, from the purely selfish motive of desire to avoid care and trouble and of having more to spend on social pleasures."

"It does not appear to me that this lessening of the birth rate is in itself an evil, or that it will be worth while to attempt to increase the birth rate merely for the sake of maintaining a constant increase in population, because neither to this nor to the next generation will such increase be especially beneficial."

**Declining Birth Rate.**—In the recently issued report of the National Birth Rate Commission on the Declining Birth Rate, one finds the following important statement among the various causes: "Conscious limitation of fertility is widely practised among the middle and upper classes, and there is good reason to think that in addition to other means of limitation, the illegal induction of abortion frequently occurs among the industrial population."

"The decline in the birth rate at present is not eugenic, but dysgenic. Restriction prevails most in the classes in which the conditions of family life are most favorable, and the largest families are found under those conditions, hereditary, environmental, or both, which are most adverse to the improvement or even maintenance of the quality of the population."

Beyond these facts attesting the recognition of conscious limitation of offspring there appears to be evidence that the State itself has taken cognizance of important phases of race improvement which are to be

secured through the limitation of procreation. The eight or nine states possessing statutes providing for the legal sterilization of various types of defectives and degenerates in the community put the stamp of legal authority upon the utility and desirability of birth control in behalf of racial betterment. Those progressive states, whose laws demand a certificate of health as a prerequisite to marriage, point out the desirability of state intervention to prevent the conception of physical and mental undesirables. The purpose of the segregation of defectives is certainly for the protection of society through the enforced limitation of potential pregnancies.

**The free and frank discussion of birth control** is not criminal nor should it be regarded as immoral or obscene. Race suicide is not due to diminished number of births any more than to an increased number of deaths but depends upon the relative proportions of each. In Holland, where birth control is recognized and sanctioned by royal decree, the crude death rate, for the five year period 1906 to 1910, is in marked contrast with the rates existing in cities in this country, where birth control is regarded as a thing unholy and unclean. In Amsterdam, for example, the mortality rate for the period was 13.1, Rotterdam 13.4, The Hague 13.2, while for the same period in Boston it was 17.9 and in New York 17. It is conceivable that the desired offspring have greater opportunities for life in Holland than the undesired offspring in the United States.

Political economists have not hesitated to discuss the problems of over population nor to dwell upon the part that Malthus' positive and negative checks play in reducing the birth rate. Sociologists, criminologists,

and legislators have not hesitated to discuss the truth in frank outspoken terms.

While numerous physicians have contributed to the literature of the movement, the organized medical profession has thus far taken no active steps to record its opinions upon the subject. There is pending before the New York County Medical Society at the present time a resolution advocating the support of the Medical Society of the County of New York in behalf of the proposed amendment to Section 1142 of the Penal Code of the State of New York, which provides that duly licensed physicians shall be permitted to prescribe methods of preventing conception. It is to be hoped that careful consideration will be given to this matter so that the reasons for and against the proposed amendment may be clearly presented. Regardless of what action may be taken, a full report upon this subject is desirable.

**Birth control discussion** not only marks a large movement that possesses unusual significance from the standpoint of public health as well as of eugenics, which is involved, but is a vital problem involving the right of free discussion of a subject that is not salacious. Serious debates upon important topics of this character should be welcomed and when they trespass upon the field of medicine, as certainly as does the problem of birth control, the medical profession should not prudishly avoid the issue but should meet it squarely in its discussions.

There are many angles to be faced. Agreement with enthusiastic propagandists is not essential, but a calm, dispassionate weighing of the evidence by those whose experience should present most abundant facts for consideration is to be expected.

Herein, medical opinion may be depended on to preserve a conservative balance and arrive at a decision meriting consideration by legislators. The principle of the limitation of offspring has been under consideration for centuries, and attempts to check public comment on facts known to exist at this time in intelligent communities is to turn back the wheels of mental and moral progress untold generations. Honesty in thought and utterance is more beneficial than a superficial prudery covering up false thought and untrue living. The truth is known to physicians and they should have the courage to make their knowledge serve the public weal by means of voice and pen. Do not doctors believe that the facts concerning the limitation of offspring merit investigation and publicity? Do medical men favor the continuance of abortifacients and abortions with the attendant hazards or are they conscientious objectors to contraception? To destroy the product of conception in order to conserve the health of a tuberculous woman, a nephritic or cardiac invalid is regarded as wise medical judgment and is perfectly legal. To teach such a woman how to avoid pregnancy is a far more intelligent medical policy, but this constitutes an illegal act punishable by fine or imprisonment, or both.

**Foeticide** is looked on with almost the same indifference as is infanticide in China. To prevent the creation of life is more beneficial to the morals and ethics of a community than to condone or tolerate the destruction of the growing living ovum, potentially a child. If the law on the subject has become obsolete it is time to repeal or amend it. Judge William Wadham in a judicial opinion honestly and prophetically states "The question is whether we have the most in-

telligent law on this subject that we might have." . . . . "I believe we are living in an age of ignorance which at some future time will be looked upon aghast."

**Industrial Tuberculosis.**—Is tuberculosis to be classified in any way as an industrial disease? Are the inherent hazards of industry responsible for the development of the malady? It is true that the industrial workers of this country constitute one-third of the population, while they furnish one-half of the deaths from tuberculosis. It is undeniable that there are certain definite industries which give a higher death rate from tuberculosis than the average rate for all industries. This fact, however, does not necessarily demonstrate that the high tuberculosis rate is actually dependent upon the peculiarities of the industry.

Hoffman has stated that of the 752,000 cases of tuberculosis in wage-earners, *75 per cent are at least postponable*.

The Illinois Industrial Board took the position that "the basic principles of compensation laws is that the industry rather than the individual workman or employer should bear the inevitable hazards of the production." From this point of view it is important to determine whether tuberculosis actually arises from inevitable hazards of production.

The conditions predisposing to tuberculosis are largely those rising from mineral dusts, metallic dusts, and toxic gases, vapors, and fumes. To these must be added, exposure to sudden changes in temperature, and more or less constant working under conditions of cold and wetness. The most important dust hazards appears to be in the marble, stone, and metal industries. The

utilization of blowers, however, in these industries lessens the danger considerably, and while it does not entirely remove the hazards of the occupation, it decreases them materially.

According to the census of 1908 during the age period of 25 to 40 years 30.9 deaths of each 100 deaths are due to tuberculosis among compositors and printers. Among marble and stone workers it is found to be 41.1, boot and shoemakers 44.1, tailors 41.2, bookkeepers 41.9, glass workers 40.5, and barbers 40.1. Miners and quarrymen have only a rate of 5.3, during the same age period but this misrepresents the actual occurrence of tuberculosis owing to the fact that the high accident rate decreases the number of men in service sufficiently long to contract the disease.

**Environment An Essential Factor.**—Undoubtedly, one of the great hazards in all these industries is to be found in the environment as distinct from the industry itself. In the language of Hayhurst, "the causes of occupational diseases are industrial subjection to dust, dirt, dampness, darkness, devitalized air, heat, cold, fatigue, inactivity, germs or infections, pressure and poisons. All of these constitute the cause of tuberculosis, which in truth is the terminal-occupational disease in a large majority of occupational afflictions." Viewed as a terminal-occupation disease it is necessary to appreciate that the factors to be considered in determining whether or not a disease is industrial in origin must consider not merely the hazards inherent in the industry and the environment, but the care in the selection of the workers who are employed in specific occupations.

Among the employees themselves there arise very important items dealing with the

heredity and race of the individuals as well as the home, environment, and the personal habits, particularly in so far as alcohol is concerned. The previous occupation of an employee may have laid the ground work for tuberculosis and have broken down the resistance of the worker to the disease, so that he falls a victim to the tubercle bacilli and his death is charged against an industry which in itself was in no wise responsible for it.

It is a matter of common knowledge that the tuberculosis curve is related to the size of towns, density of population and the social well being of the people. Tuberculosis is twice as common among tenement dwellers as among those living in separate homes. The lack of adequate toilet and bathing facilities, poor ventilation, and home and room congestion are distinct factors in increasing susceptibility to tuberculosis. The average family, however, does not select housing conditions of this character from choice, but this is in a sense determined by the family income, which may be insufficient to procure more satisfactory or more sanitary quarters.

**The investigation of tuberculosis** in Cincinnati of the inmates of the Municipal Tuberculosis Hospital pointed out the following factors (*Public Health Bulletin*, No. 73). "1. Occupation per se has been a relatively unimportant factor. 2. Tuberculosis in family is exceedingly important. 3. Dissipation and cheap hotel and lodging house life have been the most constantly present of any deleterious influences. 4. Underlying (3) are two factors: (a) innate lack of personal responsibility and deficient moral stamina on the part of the patient, (b) bad housing conditions for which the city is responsible."

Long hours of labor and inadequate incomes are deleterious influences chargeable to industry, and in so far as poverty and working conditions are responsible factors in determining tuberculosis, they are certainly partially due to existent shortcomings in industry.

Hoffman, in *Bulletin 79* of the Department of Commerce and Labor, comments, "Since it is possible by intelligent factory inspection and control, and with special regard to ventilation (that is, the removal of injurious dust particles at the point of their origin) to almost entirely eliminate the conditions injurious to industry generally, it is not going too far to advance it as a fundamental principle of sanitary legislation that the consumption death rate among wage earners can be reduced, by intelligent methods, to a ratio as low as 1.5 per 1,000."

The Cincinnati study stated among its conclusions "a goodly percentage (estimated at 19.3 percent. in our series) is due to occupation hazard and bad working conditions, but in the majority of instances these hazards are not necessarily inherent in the occupation, most of the deleterious factory influences found being those which existent legislation is adequate to remove."

The same report, in an investigation of the cases reported to the Department of Health, claims that it is reasonable to name as the chief factors in the causation of tuberculosis the following items in their approximate order of importance. 1. Insufficient income resulting in poor or insufficient food, heat, clothing, and recreation. 2. Family infection and family predisposition. 3. Occupational hazard. 4. Alcohol, which seems to act as a link in a vicious circle, aggravating all other deleterious influences and exerting itself most strongly

when combined with one or more of the foregoing.

**Insufficient Income A Factor in Tuberculosis.**—From an analysis, therefore, of the underlying factors of tuberculosis, it is found that insufficient income probably is of primary importance. The low state of wages in this country relative to the amount necessary for the maintenance of conditions favoring physical health and vitality, as well as mental development and moral stability is not an item which can be dissociated from industry. It represents an indirect hazard, probably of far greater importance than are the inherent hazards of industry. This factor belongs to the types which may be removed or corrected through an adequate public opinion demanding a more healthful living wage. The fact that poverty is probably the most powerful predisposing cause of tuberculosis indicates that whatever action or agencies will improve the economic status of workers will be of marked influence in decreasing the death rate from tuberculosis.

In the interpretation, therefore, of the statistics concerning tuberculosis in occupations, there should be borne in mind the numerous collateral factors of equal, if not greater, importance than the industry itself. Only by an analysis of this type is it possible to weigh the evidence and determine with accuracy in how far tuberculosis is to be regarded as an essential industrial disease or as a terminal-occupational disease.

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**Antidotes in Mercurial Poisoning.**—The treatment of accidental or intentional poisoning with mercuric chloride has called forth considerable discussion in the literature for the past two years, owing to an apparent increase in the number of poisonings

from this corrosive agent. For many years albumen has been regarded as the proper antidote for mercurial poisoning. Among other antidotes Hall's solution of potassium iodide and quinine has been recommended as have been sodium bicarbonate and sodium acetate, potassium bicartrate and sodium sulphate, stannous chloride, calcium sulphite, sodium phosphite with sodium acetate.

An experimental study of Antidotes in Mercuric Chloride Poisoning by Bernard Fantus (*The Journal of Laboratory and Clinical Medicine*, September, 1916) calls into question the utility of most of the above named agents. While the studies were made of the action of the chemical agents upon poisoned rabbits, the nature of the investigation is such as to indicate that the observations are useful for application to human beings suffering from mercurial poisoning.

The conclusions arrived at indicate that egg albumen, milk and serum albumen are practically worthless unless given immediately after the poison is swallowed, these being conditions contrary to those ordinarily existing for the administration of antidotes. Sodium phosphite and sodium acetate in the proportion of 6 parts to 4 parts (Carter's antidote) appeared to give the most satisfactory antidotal effects even when the antidote was administered a considerable period of time after the poison had been ingested.

The author assuming theoretically that sodium hypophosphite should be a better reducing agent than sodium phosphite found that the antidotal action was somewhat more uniform than that of Carter's antidote, though possessing no superior value to it. As a result of his studies, he recommends for the immediate treat-

ment of mercuric chloride poisoning the administration of a tablet containing sodium phosphite 0.36 grams and sodium acetate 0.24 grams. In the absence of this combination, he advises the administration of sodium hypophosphite 1 gm., water 10 cc., and hydrogen peroxide 5 cc.

If the amount of poison taken be known the amount of hypophosphite administered should be 10 times that of the poison taken. To avoid any harmful effects from large amounts of hypophosphite, copious lavage is advised to secure the dilution of the antidote. Following this treatment a safe dose of the antidote is to be administered every 8 hours for several days.

It is important to know that calcium sulphite in itself possesses too great toxicity to be serviceable as a routine emergency antidote.

#### **Investigations of Antidotes Desirable.**

—Investigations of this character which seek to establish on scientific chemical grounds the antidotal properties of medicaments are exceedingly necessary in order that proper estimation may be arrived at as to the therapeutic value of heralded curative agents.

The literature of medicine abounds with numerous drugs which for many years were estimated to be of considerable value. Authors of textbooks, without reinvestigation or retesting, have carried on the medical lore of the past. Too frequently, it is forgotten that the sciences of physics and chemistry have made marked strides in the last generation or indeed during the last decade. It is not an unfounded presumption to believe that many of the drugs which had vaunted value in the past represented the most effective medicaments for the period of time at which they were intro-

duced, though there are many which today might well be supplanted on scientific grounds by more valuable drugs.

There are many instances where the traditional use of a drug has been found after investigation to be based upon scientific principles which were unknown during the times that the remedy gained its supporters. The use of quinine for diphtheria, mercury for syphilis, and ipecac for dysentery represent drugs of this character.

**In the field of toxicology,** however, particularly where chemical antidotes may be required, there is opportunity for renewed study of the value and method of action of agencies now employed. The use of animal experimentation together with *in vitro* experimentation is of distinct advantage in corroborating or supplementing the experiences of the past.

The constant revisions of the pharmacopeia bear witness to the alterations in medical judgment as to the usefulness of therapeutic agents. The impetus developed by lack of opportunity to receive drugs and chemicals formerly available from foreign lands is undoubtedly enlarging the field of clinical research and new drugs are being tested with a view to ascertaining their serviceability and effectiveness in place of those now only securable with difficulty. Thus, oil of chenopodium was discovered to be a valuable substitute for thymol in the treatment of uncinariasis. The pharmaceutical laboratory, the research chemist and the clinician are constantly working to devise more potent remedies and with their discoveries numerous old agents may be discarded. The revisions of the pharmacopeia seek to reject medicaments which apparently have outworn their usefulness.

The current literature of the day seeks to

present the newest discoveries in therapeutics. Too frequently the authors of articles dealing with the treatment of diseases base their conclusions upon too small a group of cases to make their observations reliable or to establish them as worthy of adoption by practical practitioners. By testing and retesting, by checking and re-checking, by scrutinizing technique, by conservative skepticism of implied results, and by honest criticisms of theory of medical action the science of therapeutics is being brought to a higher level and to a greater degree of accuracy.

The knowledge of a few drugs, their indications and mode of actions is of far greater value than a smattering of long technical names. Drugs sufficiently active to alter the metabolism of the body or to effect alterations in specific viscera must be selected with caution lest the effect of the drugs themselves prove to be more serious than the symptoms or disease for which they are employed. There are at the present time few specifics in medicine and the majority of these have been developed on a scientific basis during the past generation.

**Therapeutics In A State of Transition.**—As part of the art of medicine, therapeutics forms the most important factor in the management of disease. The transformation in the courses of therapeutics in our medical schools bears witness to the recognition of therapeutic methods and devices, which for long years were suggested or hinted at but were unutilized because viewed with disfavor or because they lacked adequate scientific foundation. The science and art of therapeutics are in a state of transition as must always be the case of a developing subject. It is safe and reasonable

to believe that the constant flux of opinion must lead to more definite knowledge.

The truth of the value of physical and chemical agencies must be capable of demonstration beyond cavil. The therapeutics of mercury have filled volumes, but the methods of combatting its evil effects are just beginning to receive adequately scientific consideration. Obviously, the best method of treating mercurial poisoning is to prevent its occurrence, but this is in the domain of education of the public, manufacturers, and distributors of poisonous mercurials and in the development of adequate safety devices for those employed in occupations or industries making use of toxic mercurials in any form.

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**A Municipal Experiment.**—Tuberculosis may properly be regarded as a disease whose rootlets penetrate into every part of the social soil. In order to achieve results, it is recognized that the incipient cases must be promptly diagnosed. To accomplish even greater ends, it is essential that society reduce to the minimum all hazards of living, personal and civic, that predispose to the infection by the *bacillus tuberculosis*.

As a municipal problem, the prevention and control of tuberculosis is of tremendous economic importance. Great interest should be felt in the experiment to be begun under the auspices of the National Association for the Study and Prevention of Tuberculosis. A sum of \$100,000 has been contributed by the Metropolitan Life Insurance Company for testing out all practical measures which may secure a decrease in the incidence of tuberculosis. Some city in New York or Massachusetts, with an approximate population of 10,000 will be chosen as an immense vital laboratory in which to study

the interaction of social, medical, civic, and institutional agencies as practical factors in decreasing the tuberculosis morbidity and mortality rate.

While the period of time, 3 to 5 years, is probably too short in which to arrive at definite conclusions, it is undeniable that the thorough organization of a municipality with a view to raising the general standards of health and sanitation will be productive of important and suggestive results even after the lapse of a comparatively few years.

A campaign for the reduction of tuberculosis must carry with it a recognition of the fact that the general prevalence of tuberculosis is such that in attacking this single disease, the central point becomes not the disease itself but the entire health problem of the community. The problems of the milk supply, the tenement houses, the medical inspection of school children, the industrial organization of the community, the economic problems of wages and hours of labor, the provision of hospital and dispensary facilities, the establishment of diagnostic laboratories, the creation of visiting nursing and visiting dietitians, the regular physical examination of adults, and countless other devices now utilized for the protection of the general health form invaluable agencies for combatting tuberculosis.

Approaching the problem of the reduction of tuberculosis, the thoughtful director of the experiment must needs recognize that what appears to be the primary object virtually becomes of secondary importance in view of the possibilities of an organized effort to raise the standard of public health.

This municipal experiment must possess practicality, because in order to be of permanent benefit to the public, it must work out the machinery which would be available in any community of whatever size at a per-

capita cost that would not be prohibitive. The results achieved must be demonstrated beyond the skeptical criticism of unbelievers lest there be opposition to the extension of such an experiment in other communities on the grounds that the results attained were inconclusive, while the expense involved would be unwarranted without the promise of specific permanent results.

**Medical Cooperation Imperative.**—The most superficial study of the situation indicates that the experiment demands the very hearty cooperation of the physicians of the city chosen. The place which physicians are to occupy in this experiment necessarily must be of the utmost importance. Without the warmest support of the profession and harmony in action, it is doubtful if the best facilities will be afforded for formulating and carrying out the numerous plans necessary for overcoming the predisposing causes of tuberculosis. In many ways, the physicians, who are to be called upon, have an opportunity to become practical civic research workers, and it is obvious that their interest in the public welfare will stimulate them to every effort to make the vital experiment a tremendous success.

Fortunately, a physician, Dr. Donald B. Armstrong, has been selected as the field director, and his experience in medical, social, civic, and philanthropic work makes it certain that he will weld together all the interests in the selected community for the benefit, not merely of this community, but for the betterment of living conditions throughout the country. This experiment now becomes a center of public interest for those concerned with the tuberculosis problem. Its success or its failure will be of vast importance to all mankind.

**Candy for Children.**—In teaching hygiene in the public schools it is essential that facts be presented in a plain, straightforward manner. Unfortunately, at the present time, the State laws require that a definite percentage of the time allotted to the teaching of hygiene be taken up with discussions of the dangers of alcohol and tobacco. As a result, a disproportionate part of the time is devoted to these hallowed phases of hygienic instruction. Extreme views on all topics are to be avoided in so far as may be possible. In a recent book (*Health Reader* by Harvey W. Wiley) prepared for school use and instruction in physiology and hygiene, one finds statements like the following.

"An excess of sugar in the body, though it is fattening, is injurious to health. The alarming increase in this country of the disease called diabetes may possibly be due in a degree to the largely increased consumption of sugar per person. For the same reason candy eating among children is extremely threatening to health. Sugar may make children fat, but it does not make them healthy. They get all the sugar they need in their usual food."

"Sometimes the chocolate is mixed with milk and also with sugar, to make the well-known milk chocolate. For persons engaged in hard labor these sweetened chocolates are excellent foods. But they are not suitable for children to eat. They unbalance the ration, add a stimulant to the food which the child does not need, and create a taste for sweets which, if indulged, must necessarily interfere with the health and general welfare of the child. Chocolate candies should be eaten only by grown people who work hard, and should not be eaten by growing children."

"What effect has the eating of candy on the health of the consumer? Aside from the nature of the ingredients it contains, I must say most emphatically that candy is not a suitable food for children. It contains practically no material which will build or restore tissue, but consists essentially of sugar, which, as a food, produces only fat, heat, and energy. Hence, children who eat large quantities of candy unbalance their

ration and in that way it becomes harmful. The bones and teeth are not well nourished, the nitrogenous tissues of the body suffer from hunger, and the work that food in general is supposed to do is hindered. Unfortunately, candy is eaten chiefly between meals, which renders it an additional danger to health.

If older children engaged in active exercise and hard work wish to eat candy, they can get a good deal of strength and energy out of it, and it will thus be of use to them. But as a food for young children candy in any noticeable quantity must always be considered dangerous."

There is a great question as to whether information of this character is particularly valuable. Foods are essential for purposes of supplying heat and energy as well as for building or restoring tissues. Energy producing foods are in many ways saving of tissue destruction. The advice given is surely open to question, as the addition of chocolate candy, for example, to the dietary need not unbalance the ration nor indeed does it necessarily create an unnatural appetite for sweets. There is every reason to believe that pure candies, as well as other confections, milk chocolate in particular, occupy a distinct sphere of usefulness and when rationally eaten play an important part in the dietary of children. The existence of sugar in natural foods, such as syrups, beets, carrots, turnips, together with all the fruits, shows there is a natural place for securing sugars in the food world. While theoretically starches and sugars have an equivalent caloric value, the question of palate must receive consideration in the determination of a dietary.

It is doubtful if instruction of the character quoted will receive or is entitled to even reasonable acceptance by children in the form stated. It represents an extreme view and in consequence will be rejected by most of those to whom it is presented as

being decidedly opposed to common practice and usage, as well as tradition and scientific advice. Knowledge regarding foods should be disseminated, but forbidding the use of candy to children is just as valueless as forbidding meat or protesting against any diet other than that of the vegetarian nature.

The mixed dietary is the most valuable and most serviceable for all individuals. The problems involved in the adjustment of the various constituent parts of dietaries are difficult to solve in the light of questions of taste and pocketbooks. Reasonable quantities of sweets are essential to the development of strength and power and need not essentially unbalance the daily diet.

It is true that sugar, as a pure carbohydrate, cannot supplant in the bodily economy foodstuffs containing adequate proportions or even small proportions of protein and fats. On the other hand foods rich in protein and fat cannot atone for their lack of carbohydrates.

Is it not possible to teach the value of foodstuffs to children without discounting to zero the value of any particular article which actually possesses food value? In discussing candies, impurity, adulteration, and false branding constitute far more useful and important topics. Growing children should be taught the nature, dietetic, economic, and hygienic value and use of candies. They will be more likely to respond to such teaching than to accept instruction to the effect that such foods are only serviceable for hard working adults. It is perfectly true that children will develop without the use of a large variety of specific commodities, but that is not a reason for indicating that abstention is the only method conducive to health. Candy certainly has a place in the dietary of children.

### Drug Addiction—The Medical and Medico-Legal Problem of the Hour.—

The problem of the drug addict grows more serious every day. The avalanche of anti-narcotic laws that well meaning, but ill informed zealots have been responsible for in so many instances, have accomplished little or nothing aside from placing a few more useless and quite unnecessary restrictions on the busy medical practitioners of the country. Instead of reducing the sale of drugs to addicts, most of the laws thus designed have simply forced the traffic into new channels, and caused the whole matter to take on new and more sinister aspects.

It is hardly fair to declare however, that the anti-narcotic laws are wholly barren of results, for while they have in the main, proven inefficient in actually curbing the drug evil, they have served to bring the problem to the attention of many thinking men and women who would otherwise have given it little or no thought. As some one has said the surest way to correct an evil is to bring it into the light of publicity. If the agitation for anti-narcotic legislation has accomplished little else thus far, there can be no doubt that the people at large—and the profession, too—have been taught a great many facts concerning drug addiction than they never knew before. The drug addict, poor soul, is gradually being considered as the unfortunate victim of a pathologic state for which he is in no way responsible, rather than as a criminal or wanton panderer to vicious appetites. This radical revision of attitude towards the drug habitue bids fair to do much to place his treatment on a just and rational basis. With this idea of drug addiction more generally accepted it is not too much to expect that existing laws will be made more practical and effective, and instead of persecut-

ting the drug addict, will seek to provide means that can be relied upon to restore him to health and a normal physical resistance. Thus again we get confirmation of the doctrine "all things work together for good." Futile as our anti-narcotic laws have been in accomplishing their avowed purposes, they surely have not been in vain.

"No stream from its source,  
Flows seaward, how lonely so ever its  
course,  
But what some land is gladdened. No star  
Ever rose and set without influence some-  
where."

Of direct bearing on the ultimate benefits sure to accrue sooner or later from our anti-narcotic laws, impractical as they may be at the moment, is the announcement of the very important symposium on anti-narcotic legislation to be held under the auspices of the American Medical Editors' Asso. at the Hotel McAlpin Wednesday afternoon Oct. 25th, at 2.30 P. M.

From the imposing list of jurists, national and state officials, social workers, and medical men, who are to take part in the symposium, and all of whom we happen to know have given much careful thought to the question of drug addiction in all its phases, this meeting promises much.

Every physician or layman who is interested in this problem of anti-narcotic legislation should make every effort to be present. The meeting will unquestionably be one of the most important and consequential held thus far and it is earnestly expected that this forthcoming discussion of narcotic drug evils by men whose opinions and utterances command the deepest respect, will have a constructive and far reaching effect on the whole situation.

**The After Care of Poliomyelitis Patients.**—Now that the epidemic of poliomyelitis has subsided, there is time for reflection as to some of the general gains which have followed from the campaign carried out for its control. In the United States practically no State has escaped the presence of infantile paralysis. Of the approximately 23,000 cases reported, fully 18,000 developed in the States of New York, New Jersey, Massachusetts, Connecticut, and Pennsylvania.

Despite the high death rate for poliomyelitis in New York City, the general death rate of the city has not been increased. The infant mortality is no higher than that of past years and even the deaths from congenital causes are lower than during the previous year. It is probable that the general campaign of public education, together with the sanitary improvement of conditions have been to no small extent responsible for improving the general welfare of the community. The large epidemic of influenza plus that of infantile paralysis has not succeeded in increasing the mortality of the community. A most striking cause to this end is found in the extreme reduction of infant mortality from diarrheal diseases. It is undoubtedly true that the close supervision of infant welfare, the prompt utilization of physicians, and the extended usefulness of hospitals, and dispensaries played an important part in decreasing diarrheal diseases.

The advantages of seizing upon a single disease as a lever with which to move public opinion apparently has been demonstrated. In times when dramatic epidemics do not exist it is more difficult to secure the co-operation of the general public in behalf of their own personal welfare. Now that the public conscience has been aroused and with the excellent results which have been demonstrated during the past summer, it should

be possible to continue and maintain the interest of the public in various devices under municipal control which are aiming to decrease morbidity.

In the wake of the epidemic, there is a comparatively small percentage of individuals who may be regarded as bedridden invalids. It is too early to determine with accuracy the number of victims whose paralysis will demand extensive aftercare. Of the patients who have survived the attack probably 40 per cent developed no paralysis during the attack or sustained minor paralysis, such as for example paralysis of the external oblique muscle or a slight facial paralysis, conditions which will in no wise interfere with their capability of development and which indeed may be restored to normal within a comparatively few months after discharge. Another group will require aftercare for a variable period of time but will probably be restored to a more or less normal condition, enabling them to pursue their education and training without any interference with their potential power. A third group will demand continuous aftercare for a period of time varying from one to three years, at the end of which their handicaps will be materially lessened but with the probability that their education will require adaptations and their vocational opportunities will be limited.

The work of aftercare is now the most important phase of public service which may be given to the afflicted. The utilization of conveyances for carrying children to dispensaries, the wide use of visiting nurses or nurses capable of giving massage, re-educational exercises, or electricity in the homes and of offering proper instruction to parents concerning the general hygiene of the children represent the particular needs of the time. A sufficiently large number of agencies already exist for carrying on the actual orthopedic work which may be required.

The real responsibility consists in providing for every individual adequate facilities for their restoration to the maximum usefulness and in making it possible for them to secure and utilize these facilities. The conscientious endeavor to carry out the well laid plans should result in minimizing the residual number of cripples whose handi-

capped lives will constitute the unhappy monument of the epidemic of 1916.

**Bacterial Protein Therapeutics.**—The impression is steadily gaining ground that not all the benefits that have accrued from the use of vaccine therapy have been due to the specific value inherent in the suspension. It is beginning to be believed that the bacterial proteins thus administered exert a non-specific but undoubtedly definite effect upon the system. J. L. Miller of Chicago has remarked that good results may be secured in certain infections by injecting a specially prepared proteose solution, and arthritis has been benefited by injections of typhoid vaccine.

Diphtheria antitoxin has been recommended for a number of non-diphtheric conditions, and Berkart in his book "On Bronchial Asthma" strongly urges the use of diphtheria antitoxin in this disease. Recently H. Moller (*Correspondenz-Blatt für Schweizer Aerzte*, July 8, 1916) reports a case in which a woman sixty years old was suffering from an attack of erysipelas, and great improvement followed the administration of diphtheria serum. The first dose of 3,000 units was given April 15th. On the seventeenth the second dose of the serum, 1,000 units, was given, and by the next day the patient was practically well. The course resembles closely that of a case reported by Pollak in 1915, but the extent to which it was influenced by the serum cannot be said to be proved.

This therapeutic influence of soluble bacterial or animal proteins may be the beginning of an explanation of some of the good results which are following the use of the so-called "unscientific" stock vaccines. And while there is yet to be much learned regarding this subject, it is at least suggestive to recall that besides the direct indications for bacterial vaccines in certain infections, there are growing possibilities that bacterial proteins may soon be classed among our most useful, non-specific therapeutic weapons.

**Autogenous or Stock Vaccines?**—There will always be a difference of opinions as to the relative values of specially prepared

and commercial bacterial vaccine. A very interesting statement regarding the relation of these productions appears in Coates' consideration of the vaccine treatment of suppurative otitis media (*Ann. Otol. Rhinol. & Laryngol.*, Dec., 1915) which states that "equally good results may be obtained by the autogenous and stock products, although preference should be given to the former since their use is undoubtedly more accurate and scientific."

There is no proof that the last part of the above statement is scientifically correct, but granting that Dr. Coates' remarks regarding the comparative merits of autogenous and stock vaccines are correct, the element of time saving, the considerably reduced expense, and the important item of convenience, certainly deserve to be taken into consideration when passing judgment.

We are constrained to believe from many experiences and letters from readers of AMERICAN MEDICINE that many of the encomiums paid autogenous vaccines have been written under the influence of those who are specializing in their production, and that there should be just as much consideration attached to one side of this subject as to the other. The makers of autogenous vaccines advise their own products, and the makers of stock vaccines recommend theirs. The practitioner is left to choose for himself, and if equally good results can be obtained with stock and autogenous vaccines—we are saying nothing about better results which are not infrequently secured with stock vaccines as compared with the special products suspension—it is certainly up to the physician in the interests of economy and rapidity and convenience to use the stock preparation.

In the same article Coates goes on to recommend home made laboratory stock vaccines to be substituted for autogenous products when available, provided the organisms can be determined. He states that good results are thus obtained, for time is saved in the beginning of vaccine treatment. The making of home made vaccines is so fraught with dangers that their preparation should never be undertaken as long as stock vaccines—from a reliable source specializing in their manufacture—are available. There is not the slightest doubt that polyvalent preparations made from a number of

different cases exhibiting varying manifestations, but due to the same strain of organism, favor a satisfactory outcome in a much more marked degree than the univalent suspensions, by increasing the production of the desired immunizing reaction. We can only smile when "home made" vaccines are recommended by those who are supposed to favor autogenous preparations and who openly assert their superiority on "scientific" grounds. Surely the argument is of the "better than thou" type and needs no refutation.

**The Increasing Cost of Medical Education.**—"The cost of medical education has been greatly increased," is the conclusion reached by an editorial writer in *Jour. A. M. A.* (Aug. 19, 1916). Continuing he points out that "The larger number of laboratories, equipped with expensive and technical apparatus which the modern school now possesses, the score of skilled, salaried teachers who devote their entire time to teaching and research, and the greatly increased cost of administration have increased manyfold the cost of conducting a medical school. At present, therefore, as shown in a recent report, the average cost of teaching a student in eighty-two medical colleges was \$419 per year, as compared with \$150, the average amount received from each student in fees. Although the cost has advanced from the point at which there were large profits for those owning the medical schools, to the present situation, where it exceeds the income from students' fees by 280 per cent., during the same fifteen years tuition fees have been increased by only 25 per cent. In eight of the state university medical schools, the fees are very low—less than \$100. The excess of expenditure over income from tuition fees, of course, has been met by state appropriations or by private gifts and endowments. During the last few years the number of free scholarships for deserving but needy students has been rapidly increased, 296 having been reported last year in forty-two medical schools. There is no reason, therefore, to worry lest the greatly increased cost of medical education will result in a 'medical aristocracy.'"



**Universal Immunity.**—“There is reason to believe that,” Baruch states (*Medical Record*, Aug. 26, 1916) “if children are injected with the serum drawn and prepared from the blood of their parents or other individuals at an early age if the donors have suffered from scarlet fever, measles, or any of the immunizing diseases, such offspring will be rendered immune to these diseases and that eventually it will be possible to breed a race of humans who will be progressively immune to all of the acute infectious diseases. The longevity of the race will then be vastly increased because of the large number of permanent disabilities that are produced by the so-called ‘diseases of childhood,’ and the above thought contains a suggestion which, carried out, will produce results of great permanent service to future generations as well as to the present.”

creative. He must bear in mind that he works hand in hand with the patient, who learns the first principles of independence by sharing in the labor of the analysis. Together they have discovered the undiminished energy, the immortal libido, and learned to free it from its bonds. Their last and greatest task is then to direct this libido into progressive, constructive paths, to set it flowing free, satisfied, and in harmony with any demands reality may make upon it, because pouring outward. Introversion brought no satisfaction. The libido finds at last what is sought there in vain. It expresses now its true nature, in which alone it can really live, for to it belongs ‘the glory to go on and to be.’

“Psychoanalysis, however far it may in itself need completion and perfection, opens up limitless possibilities and opportunities, because it deals with human life as it sweeps back into the past, as it extends in breadth and intensity into the future, and because it considers it not merely as a whole, but in relation to individual complexities and individual relationships and adjustments to the whole, and to individual share in the racial task. Beware, then, lest we pass by on the other side. Let not our ‘wise men be ashamed, dismayed and taken,’ and cry ‘Peace, peace, when there is no peace.’”

**The Psychic Needs of Mankind.**—“*Psychoanalysis*,” Jelliffe (*Medical Record*, Aug. 26, 1916) claims “is the most effective tool yet fashioned with which to discover the psychic needs of mankind and to meet them. Therefore, we cannot pass it by in indifference or fear. It is in its use that it may be rightly valued, as well as perfected where it is incomplete. It grants much to those who employ it carefully and conscientiously in knowledge, understanding, genuine sympathy, and one’s own increasing self-control and effectiveness. Its demands are even greater. It lays upon the physician the responsibility of reaching the distraught mind in its suffering and incapacity for life, of restoring such a mind by patient, unremitting effort, a slow process when dealing with the delicate intricacies of the human psyche, to a new confidence in itself in independence and freedom from infantile forces. It makes him the conductor of the new-born soul into a freedom which is racially productive and

**Glenard’s Disease.**—“Thirty-one years have now passed since Francis Glénard published his epoch-making paper detailing an intimate study of forty-five patients suffering from what he so aptly named ‘Enteroprotosie’ and which has since been most justly entitled ‘Glenard’s disease.’ Yet how few really know,” asks Gallant (*Archives of Diagnosis*, July, 1916) “just what Glénard taught or wherein his observations outstepped those of his predecessors? Succinctly stated—(a) that while a prolapsed right kidney might be the cause of the most notable symptoms (Dietl’s crises); the most easily located and the most readily replaced, the kidney only served as a ‘signpost or index’ pointing to the presence of a greater or lesser degree of prolapse of all the viscera; (b) describing a very simple, yet reliable means of making a diagnosis of ‘Visceroprotosie’ and (c) its intimate if not all

important relation to malnutrition, and so-called neurasthenia and nervous prostration.

Unfortunately, Glénard's book has never been translated, and for this reason, chiefly, in spite of the many hundreds of articles and monographs which have been published on this subject, under Glénard's disease or some synonym (visceroptosis, enteroptosis, splanchnoptosis, or the name of an organ with 'ptosis added), how comparatively few practitioners make a positive diagnosis and direct their patient as to the best means of treatment."

to radical obstetric surgery, even if forceps or version is necessary."

**Some Historical Data of Epidemic Poliomyelitis.**—"Our data of the epidemiology of poliomyelitis," says the Editor of the *Medical Review of Reviews* (October, 1916) "are derived mainly from two nations: Scandinavia, and—unfortunately for us—our own. In 1885, Medin of Stockholm surprised the medical world by adding poliomyelitis to the dreaded epidemics. His proof was overwhelming, and infantile paralysis has since been known as the Heine-Medin Disease. In 1905, his Norwegian pupil, Ivan Wickman, described the epidemic of that year, and applied the term 'abortive' to those cases of poliomyelitis in which paralysis does not supervene. In 1907, Francis Harbitz and Olaf Scheel, of the University of Christiania, studied the outbreak that assumed pandemic proportions.

"In this country, as far back as 1841, Colmer observed a group of cases in Louisiana, and in 1894 C. S. Caverly reported an extensive epidemic in the Otter Creek Valley of Vermont. But infantile paralysis did not become an American menace until 1907, when New York was invaded. In the summer and the sunshine, the invisible enemy approached, and in its path it left crippled children and corpses. The two thousand cases gave our investigators an excellent opportunity to become familiar with the disease. On the bodies of babies dead from Heine-Medin's malady the Rockefeller Institute for Medical Research achieved scientific fame. Flexner, Noguchi, Lewis, Meltzer, Martha Wollstein, Peabody, Draper and Dochez studied various aspects of the infection: the last three in 1912, published a *Clinical Study of Acute Poliomyelitis*, which is one of the chief contributions to the subject.

"Other Americans who are noted for their work in this field are Robert Williamson Lovett, who studied the Boston epidemic; Jacolyn Van Vliet Manning, who reported the epidemic in Wisconsin; Henry W. Fraenthal, who has paid special attention to the orthopedic treatment; Cushing and Crowe, who introduced hexamethylenamin into the therapy; and Wade H. Frost, of the United States Public Health Service."

**The Importance of Pelvimetry in Obstetrics.**—"It is freely admitted that pelvimetry does not always tell whether a child can be born through the natural passages or not. The angle of junction of lumbar spine and sacrum may be such as to prevent the entrance of the fetal head into the pelvis in spite of large pelvic measurements." On the other hand Cragin (*New York Med. Journal*, July 1, 1916) states that he has several times been obliged to perform a Caesarean section upon a woman whose pelvic measurements were *justo major*, and whose dystocia came as a surprise, demonstrated only by hours of test labor. Nevertheless, according to the author, "careful pelvimetry tells a great deal, and if a careful pelvimetry of the inlet and the outlet of the pelvis is practiced during pregnancy and especially if coupled with it there is a careful comparison of the size of the presenting part and the brim of the pelvis, the surprises will be few and the possibility of dystocia can usually be foretold and provided for. The mouldability of the head and the strength of the uterine contractions are always uncertain factors in the problem, but pelvimetry will usually tell us at least one factor in the problem and should never be neglected. Pelvimetry is a part of conservative obstetrics, as it will disclose a large percentage of cases in which delivery through the natural passages is impossible, and these are in the women who should not be allowed to lower their vitality or the vitality of the child by labor. Furthermore, it will disclose a certain percentage of cases in which, if premature labor is induced, delivery may be accomplished without resort



## ABNORMAL MEN AND THE DEATH PENALTY.

BY

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The old or classical school of penal jurisprudence bases its doctrines on the assumption that all criminals, except in a few extreme cases are endowed with intelligence and feeling like normal individuals and that they commit misdeeds consciously, being prompted thereto by their unrestrained desire for evil and the severity of the sentence meted out to the offender is regulated by the gravity of the crime. In this enlightened age the time will come soon, when criminal law will be based upon the views of a modern or positive school, in short upon criminal anthropology which holds that the anti-social tendencies of criminals are the result of their physical and psychic organization, which differs essentially from that of normal individuals. This science studies in detail the morphology and the various functional phenomena of the criminal, with the object of curing instead of punishing him.<sup>1</sup>

Since the state officials in Iowa were kind enough to assist in every way possible as far as supplying me with material for research work was concerned, I was fortunate enough to become quite familiar with the anatomy of murderers, the results of one investigation having been published.<sup>2</sup>

All criminals are not similarly constituted as it is known that even normal man can commit crimes under certain circumstances, juridical criminals (Lombroso), occasional criminals (Ferri), criminals by circumstances, passion or illness (Ferri), but ordinarily they are either found to be diseased, criminal insanity, alcoholic, epileptic, (psychic) or defective, born criminals (Lombroso), habitual criminals, morbid liars and frauds (Ferri).

Any one having studied criminals from an anatomical standpoint will know that the discrimination between diseased and defective criminals is by no means a task which should be put upon the shoulders of juridically trained lawyers and judges as it belongs in reality to the domain of specially trained physicians and that mistakes are and have been frequently made can not be doubted.

I have in my collection the skulls of two insane criminals who were not recognized as such, one having been executed and the other one having received a life sentence.

Whenever we hear of an atrocious murder having been committed, it is nearly always a question whether the murderer is sane or insane, but the question as to whether the unfortunate is defective or not does not come up as there seems to be no provision made in the law for it. But from anatomical data at hand I believe that the proof will be sufficient in a short time to force recognition

for the anatomically defective criminal and for this reason I present this second lecture, which represents a further study of the facts gained by the dissection of John Junkins and an examination as to the causes of the occurrence of anatomical defects.

That the Junkins case has succeeded in delivering a sharp blow to the death penalty in Iowa can be judged from the following extracts from our most eminent Judge Weaver's article.<sup>3</sup>

"The argument presented with great earnestness and force is that the appellant has been shown to be a degenerate whose defective mental and moral nature renders him no more responsible for manifestations of criminal violence than is a member of the brute creation having neither reason nor capacity to understand the moral quality of its acts. To take the life of such a person in vindication of law and order is said to be an idle act, for it can not operate as a deterrent to others of his class, for such as he are the blind slaves of their abnormal passions and criminal tendencies, and when these are aroused to activity the possibility of punishment, however severe and drastic, will not serve to turn them from their evil purpose. If a man who has led an honorable and law abiding life, and under the influence of a diseased mind, commits an atrocious murder, the law does not demand his life in punishment but contents itself by putting him in confinement, by which to restrain him from other acts of violence. *"If then," say counsel, "the law interposes the shield of its protection to save the life of a once normal person who has become insane, why should we not be equally reluctant to pronounce the death penalty upon one, who by reason of a defective organization molded by prenatal limitations and conditions, and developed in vicious environ-*

*ments for which he is not responsible, is also incapable of appreciating moral and social obligations?"*

Council here touches upon a question which is having the increased attention of students of criminology and kindred topics, and it may be true, as many learned investigators think, that the methods which now prevail of protecting society against its defective and criminal classes are so unscientific in conception and so ineffective in practice that a civilized people should discard them for other and saner schemes of retributive and preventive justice. But as we have already suggested the reform must come if at all, through the lawmaking power, and until then the courts must administer the law as it is written.

\* \* \* \* \*

The twelve jurors to whom the appellant's fate was committed reached the conscientious conclusion that, however defective he might be in the attributes which make up a normal human being, he was not so lacking in capacity to distinguish between right and wrong or in the power to resist the pleadings of criminal impulse as to justify a mitigation of the punishment which would justly be imposed upon him, *were he the equal of the average man in respect to those qualities.* Assuming the correctness of this conclusion it must be said that if punishment by death may ever be justified, no more flagrant case calling for its infliction was ever tried than is presented by the records before us. *Assuming the appellant's moral and legal responsibility,* the assessment of anything less than the highest punishment provided by law, would be a startling failure of justice.

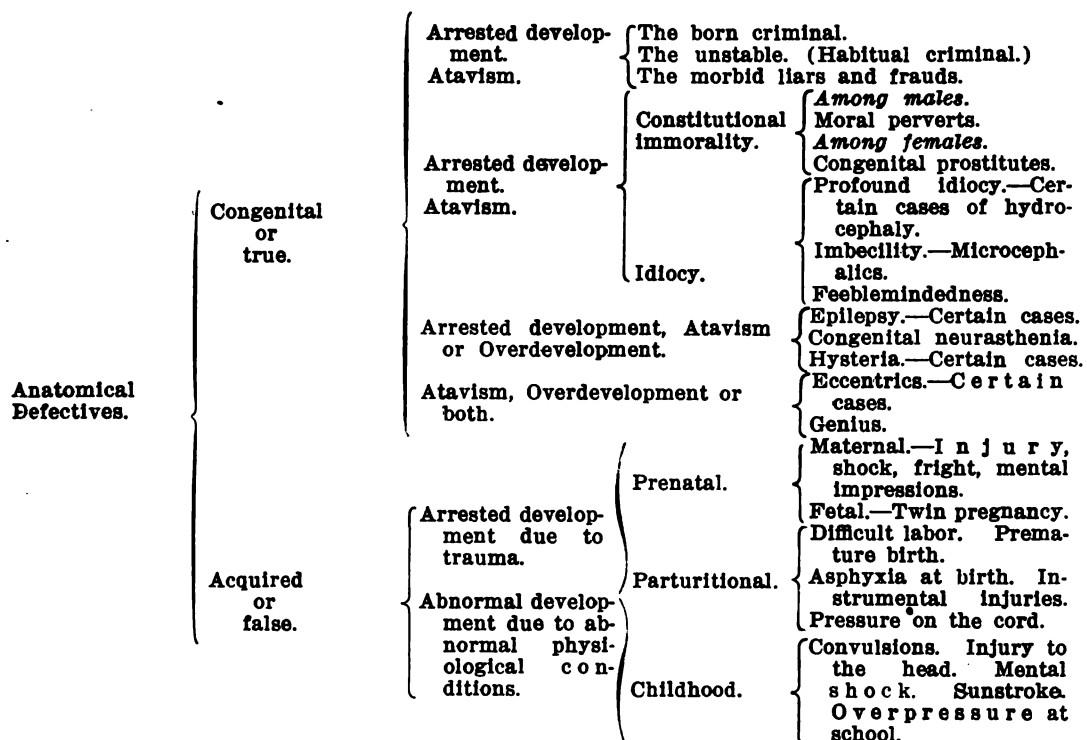
**Anatomical Defectives.**—In my studies I have come to the conclusion that an anatomical defective is a member of a large

class of abnormally constructed individuals among whose ranks are encountered variations from beastlike criminals to the most enlightened genius, who on account of being abnormally constructed, can not act like normal persons, yet although all of them possess antisocial tendencies they do not necessarily all come in conflict with the laws and regulations of the community in which they live.

**On the Cause of Anatomical Defects.—** True anatomical defects are always inherited and never acquired and it is probable that only a special tendency toward variable, arrested, atavistic or overdevelopment of certain parts of the body is transmitted, giving rise to corresponding insignificant or gross defects in body and character. There is no doubt that inheritance plays a great role in the formation, size and

#### OUTLINE OF ENTIRE CLASS OF ANATOMICAL DEFECTIVES.

(From an anatomical standpoint).



I know full well that many neurologists would beg to differ from a classification as given here, as today epilepsy, neurasthenia and hysteria are classed as constitutional neuropsychoses and born and habitual criminals and the morbid liars and frauds as psychopathic personalities but I would like to call attention to them from an anatomical standpoint.

shape of the various organs, yes even cells of our bodies, but it must also be stated that inheritance is subject to certain laws. It is true that no two livers or spleens are exactly alike although similarly constructed, as they differ even under perfectly normal conditions more or less in size, shape, color, weight and qualitative as well as quantitative function. These what might be called

normal variations, being encountered in connection with every part of our bodies, seem to stand in man as well as in the lower animals in some relation to the conditions to which each species was exposed during several generations, but as Darwin<sup>4</sup> states "No doubt each slight modification must have its efficient cause, but it is as hopeless an attempt to discover the cause of each as to say why a chill or a poison affects one man differently from another."

A detailed study of anatomical defects reveals that they belong to one or more of the following three classes, arrested development, reversion or atavism or overdevelopment.

By arrested development I understand the abnormal cessation of the ontogenetic process, which generally reveals itself in the young or adult by the persistence of an anatomical condition which being present normally in the embryo is in the latter a typical temporary, though essential phase of development. So it may happen that an otherways perfectly formed baby is born without a brain (anencephalia), the base of the cranium being covered by a thick membrane, into which the nerves pass and only those cranial bones which form the base of the skull being present (acrania) or it may happen that a baby is born with the lower part of its belly unclosed (exstrophy of the bladder) or it may be that the lower part of the spinal canal has remained unclosed (spina bifida). Cases of hare lip, cleft palate and of arrested brain development, as found in microcephalic idiots<sup>5</sup> belong also to this class. Arrested development of certain gyri and brain centres might be made to explain certain cases of imbecility in special mental qualities, for example, Dalton as regards "colour," Macaulay as to "number" or an absence or feebleness of definite animal de-

sires such as Kant with his small cerebellum<sup>6</sup>. A flat occiput although more frequently encountered in man than in woman seems to me also to be of arrested developmental origin as a flat occiput is normal in a four months embryo.<sup>7</sup>

Arrested development and reversion are intimately associated processes and when a structure is arrested in its development, but still continues growing, until it closely resembles a corresponding structure in some lower but adult member of the same group, it may in one sense be considered as a case of reversion.<sup>8</sup>

The teachings of evolution would suggest that the organs of the body in order to reach their complete development must pass through stages of development which are stationary in some of the lower forms, but according to Von Baer's law: The embryo of a given animal form instead of passing through the other animal forms, separates itself from them more and more. Therefore, essentially, the embryo of the higher forms is never like the lower forms but only like its embryo.

According to Darwin certain structures which occur regularly in the lower members of the group to which man belongs, make their appearance occasionally in him, though not found in the normal human embryo; or if normally present in the human embryo, they become abnormally developed, although in a manner which is normal in the lower members of the group. This explains readily why in the bodies and especially brains of low types of human beings we encounter so frequently analogues to anatomical characteristics of the ape, carnivorous or herbivorous animals, as borne out by numerous muscular anomalies, additional muscles and tendons. Certain sulci and gyri of the brain when showing

great similarity to those normally found in the lower animals must without a doubt be looked upon as atavistic in origin.

As man thinks, feels, desires and acts according to the anatomical construction and physiological development of his brain (as was conceded even in the olden times) it is impossible to conceive of atavism as limited exclusively to material structures even though we are not able to demonstrate in all cases by the ancient and modern methods of investigation the finer structural abnormalities, it remains a fact that psychic atavism is a dominant characteristic of anatomical defectives especially criminals. That a being should be born resembling in certain characteristics an ancestor removed by two or three, and in some cases by hundreds or even thousands of generations, is assuredly a wonderful fact.<sup>9</sup> and it must be true that many characters lie latent or dormant in both parents during a long succession of generations. A similar tendency to the recovery of long lost characters holds good even with the instincts. As Lydston states: "The outcropping of ancestral types of mentality is observed to underlie many of the manifestations of vice and crime and these ancestral types or traits may revert farther back even than the savage progenitors of civilized man, and approximate those of the lower animals who in turn stand behind the savage in the line of descent."<sup>10</sup>

Speaking of overdevelopment it is my conviction that natural (not forced) overdevelopment of certain structures and consequently also of mental traits takes place only as a consequence of a fundamental defect in the natural controlling power or that part of the nerve force which rules and regulates the development of the different systems and tissues of the body. Consequently this natural overdevelopment is encountered

ordinarily among anatomical defectives, be the man the lowest or the highest member of this class, although it is most frequent among the latter (i. e. musical idiots, the mathematical genius Gauss). In the case of a natural born criminal the already defective cerebral controlling power is never trained and consequently the inherited large animal tendencies are permitted to follow their own inclination, that is, satisfy and develop themselves by unrestrained continuous exercise.

In the case of the man of genius, the same defect in the natural controlling power is the fundamental cause which permits the inherited and already well developed tendency toward being intensely interested in one line or another to become fixed to such an extent as to lead to the early overdevelopment of certain mental traits.

These mental traits in turn are permitted to run wild on account of a defective cerebral controlling power, which although developing quite early is in most cases absolutely powerless to overcome the strong impulses of the overdeveloped mental traits.

The mind follows the channels of least resistance which corresponds to answering the strong calls of those mental organs which are best developed.

I believe that in the man of genius certain parts of the cerebral organization are of a much finer grain than of the average mortal and this might explain why the emotions are often so prominent in many of these cases, giving rise to an extremely sensitive nervous system.

The development of cerebral controlling power as far as the inhibition of impulses from the lower propensities is concerned frequently suffers as is illustrated here by two typical histories of natural born or as I term them, anatomical defective criminals,

the histories of John Junkins and C. Y. The personal histories of men of genius are sufficiently notorious to need no farther elucidation.

For Junkins history see *Ill. Med. Jour.*, Aug., 1911.

**History of Chas. Y.**—His mother in all probability a neurotic had in all eleven children, five having died in early childhood, six are still living. She died at the age of 49 from tuberculosis, and from what I was told by one of her boys, she was a hard working woman who kept the home in good condition and it was her influence mainly that kept the children straight. The uneducated father and all the living children except one girl use alcohol in one form or another but the second oldest boy having realized its bad effects has quit and I regard him as the one, who does at the present time all he can, to personally replace that sorely needed influence at home, which was lost by the death of the mother. The youngest boy has also come in conflict with the law.

**Personal History.**—Chas. Y. was born 24 years ago and has had only a few weeks schooling during his entire life. His main education has been received in smoky row (where Junkins was educated). He married at the age of twenty-three but his wife died five months later.

**Habitat.**—Smoky row, (Ottumwa, Iowa) and its degrading influences.

**Habits.**—He became addicted to alcohol in the form of whiskey in his early boyhood days and later drank beer when he could get it. He uses tobacco, chewing and cigarettes almost constantly and has also learned to use cocaine.

**Surroundings.**—Being born of poorly equipped parentage, exposed to a criminal education and brought up in criminal surroundings as existing in smoky row his future career could have been predicted.

**Crime.**—He was arrested several times for drunkenness and on April 4, 1911, he was indicted and arraigned for robbery, was convicted on April 28 and sentenced May 3, 1911, to an indetermined term not exceeding five years in the reformatory at Anamosa. Two days before he was sentenced, May 1, 1911, being out on bond, he killed T. McG. by cutting his throat with

a pocket-knife, for which he received through our efforts, a life sentence instead of the death penalty.

Overdevelopment is most frequent in the brains of the higher class of anatomical defectives and mostly reveals itself by additional fissures or sulci in certain regions, giving rise to a relative smallness and increase in gyri in these regions, whereas many coarse gyri stand out prominent in other regions. From all the brains I have examined I have arrived at the conclusion that overdevelopment in connection with the central nervous system shows itself not by an increase in size, but by an increase in complexity. Large coarse gyri I look upon as immature.

I must caution against mistaking normal anatomical variations and anatomical rudiments and fetal vestiges for anomalies as this frequently happens to the uninitiated in this kind of work.

From the foregoing classification it can readily be seen that anatomical defectiveness is fundamentally hereditary and not acquired, but there is no doubt in my mind that many factors such as habit, occupation, environment, habitation and social condition play an important role as contributory causes in fostering antisocial tendencies and bringing this class of people in conflict with the law.

**On the Recognition of Anatomical Defectives.**—That man stands alone as the greatest product of evolution by being the possessor of a central nervous system more complex than that of any other living creature is a foregone conclusion, but this does by no means imply that all men have reached the same level of development. We full well know that there exist today wild tribes, with little more than the intelligence of wild beasts and even among civilized people all grades of development are encountered, but all of them are subject to the same laws of evolution.

Nature works toward perfection in the development of all its creatures, even though they differ slightly or greatly from the normal, and to what extent perfection is reached depends in the first place on the quality of the material used. Coarse material necessarily stands lowest in the evolutionary scale and changes toward a finer quality seem to be much slower here than

elsewhere. It is mainly with these thoughts in mind that I classified the anatomical defective criminal with his coarse basal propensities as belonging to the lowest group. To what extent the highest group is developed can best be judged by studying the works of some of its members like Pascal, Byron, Kant, Bichat, Gauss, etc.

In 1844 Lauvergne<sup>11</sup> described the cold blooded assassins in strokes reproduced later by Lombroso as possessing a peculiar facies, stamped by the seal of a brutal and impassable instinct and heads large and receding with notable lateral protuberances, enormous jaws and masticatory muscles always in motion<sup>12</sup>. Since Lombroso's time observations on heads of criminals have been numerous and today it is an acknowledged fact that the science of anthropology has arisen to a great extent from the much scoffed at pseudoscience phrenology much in the same manner as the science of chemistry has arisen from alchemy, astronomy from astrology and psychiatry from demonology.<sup>13</sup>

A large percentage of anatomical defectives can be recognized at a glance, especially if the stigmata of degeneracy are numerous and well marked, and in these cases even the casual observer remarks about them, but more often the closest study is necessary to discover findings justifying the individual classification.

It must be remembered that even today with all our diagnostic methods we are not able to discover all the abnormal manifestations of the mind arising from abnormalities of the central nervous system, but an exact method of investigation should be followed in all cases. I believe with Giovanni,<sup>14</sup> "That in order to acquire the most exact idea of the nerve centers, it is absolutely necessary to investigate all the biological manifestations of the individuals." Of course that this is impossible at the present age as long as there are no special establishments for that purpose stands to reason, but I am positive that the general trend toward this idea, at least as far as criminals are concerned, is already present and is here to stay.

An ideal type of human being is a mental phantom, never seen in reality, at the same time, Giovanni<sup>15</sup> has described such a type and has mentioned three main variations of

the latter as far as measurements and general make-up are concerned. His types are undoubtedly the outgrowth of a close study and scientific interpretation of the three main temperaments of Jacques,<sup>16</sup> the mental, the motive and the vital temperaments.

Personally I make use of his ideal type and its three main forms as a basis for further study and in addition I use the classification of temperaments as given by Jacques. To give an idea, Giovanni describes the ideal type as possessing a body height equal to the distance between the tips of the middle fingers. A thoracic circumference equal to half of the stature. A sternal length equal to one fifth of the thoracic circumference. A length of abdomen equal to two-fifths of the thoracic circumference. bi-iliac diameter equal to four-fifths of the abdominal length.

Careful measuring of the head, according to the rules laid down by Hollander<sup>6</sup> follows next and than a close inspection of the entire body for abnormalities (anomalies) or stigmata of degeneracy<sup>16</sup> including a careful tracing of all the viscera with a blue pencil.

Next in order is a careful testing of all the senses and the most important reflexes by physiological methods and of the different mental qualities by psychological methods.

(For a working outline on anomalies see<sup>16</sup> almost any text-book on nervous diseases).

#### Post Mortem Findings in Anatomical Defectives.—

*In the Body.*—The number of anomalies found in the bodies of criminals surpass the average greatly as can be seen from Guerra's statement, that he found 14 anomalies of arteries in 16 criminals against four in twelve normals. I have found 32 muscular as well as arterial and nerve anomalies in the body of Junkins, in addition 9 osseous in the skull and 10 vascular in the brain, 16 more can be counted in the brain itself making a total of 67 anomalies. I am sorry that there was no time left for the examination of the skeleton as I am positive some more anomalies would have been discovered.

*In the Skull.*—That the well known retreating forehead and flat occiput are typi-

cal and marked examples of arrested development was known to Sharpa, Hyrtl<sup>17</sup> and Carus<sup>17</sup> but that such defects affect the gyri type of the brain<sup>2</sup> was shown only indirectly by Calori<sup>18</sup>, Meyer<sup>19</sup>, Meynert<sup>20</sup> and Rudinger.<sup>21</sup>

It is easy to conceive how defects of this character might be instrumental in disturbing the other developmental processes, as for instance the closure of the sutures of the skull.

Personally I am inclined to look upon a narrow upper part of the head (distance between the parietal eminences much smaller than between the external auditory meatuses) as being also a sequence of arrested development. Many cases of this character show an altogether too early ossification of sutures with a corresponding malformation of the skull and a restricting influence on the development of the underlying convolutions of the brain. Of course it is possible that a too early ossification of sutures is simply a symptom of arrested development of the brain, but even then, subsequent development of the brain is undoubtedly greatly restricted after such ossification takes place.

Ordinarily ossification of the sutures commences on the inside of the skull at about the thirteenth year and has usually commenced on the outside at the age of forty, but at this time the sutures on the inside of the cranium should still be distinct. At the age of sixty ossification can be expected to be complete on the inside and on the outside at the age of eighty. In the skull of Junkins (age 26) all the sutures were ossified completely except one in the temple.

The weight of the skull is frequently above the average. Junkins 1,067 gm., Billy Arholt a Chicago robber 910 gm., whereas the normal skull of a white athlete weighs 872 grams.

The mandible of this class of criminals weighs mostly far above the normal, Junkins 157 grams, Arholt 83 grams, white athlete 91 grams. These weights correspond fairly well with the statement of Manoevrier who gives the average weight of the Parisian criminal jaw as 80 grams and that of murderers as 94 grams, showing that the jaws of murderers are heavier. De Bierre gives the average weight of the nor-

mal mandible as 69 grams and that of criminals as 95 grams and it seems to me that the statement, that abnormally heavy jaws in criminals are mostly found in those inclined to deeds of violence is correct.

*Anomalies of the Skull.*—Kurella<sup>22</sup> while examining 830 skulls of criminals, guilty of serious offences, found that 77 per cent showed more than three anomalies and that 43% showed more than five anomalies. Ferri<sup>23</sup> states that anomalies are frequent in female criminals but that they are three or four times more frequent in male criminals. Homicides 4.1%; thieves 4.2%; prostitutes 5.5%; infanticides 4%. Junkins showed 7 distinct anomalies and Arholt 6 out of sixteen examined for.

*Anomalies of the Brain.*—The vascular system of Junkins' brain showed ten gross anomalies and in the brain itself the anomalies as far as the measurements of the gyri and sulci were concerned when compared with average measurements taken from fifty brains<sup>24</sup> pointed distinctly to great variations in the left parietal, the frontal and temporal regions. At least sixteen distinct anomalies were found which were partly of arrested developmental but mainly of atavistic origin (for detail see 2). Some of the findings showed reversion to the ungulates, to the carnivora and some to the apes.

Close study of the gyri brought to light that the frontal and parietal regions were late in developing (maturing) and that the temporal lobe had as yet not reached its full complexity. Careful measurement of the cell-layers of the cortex seemed to show a deficiency in gray matter and by my own method of fibre dissection I was able to demonstrate one of the most important points, namely distinct arrested, anomalous development and atypical construction of the association bundles of the brain.

*In Idiocy and Constitutional Immorality.*—I do not intend to convey the idea that all cases of idiocy are due to anatomical defectiveness as I fully realize the important factor "diseased condition" in connection with every one of the groups mentioned. No doubt every one is familiar with the striking asymmetrical development of the anatomical factors forming the physiognomy of the idiot. Wilmarth<sup>25</sup> noted in 100 autopsies

FIG. I. Calvarium of John Junkins. For other pictures of his skull see *Illinois Medical Journal*, August, 1911.

FIG. II. Brain of Jenkins, viewed from the left.

FIG. III. Brain of Jenkins, mesial surface of left side.



FIG. VI. First stage of fibre dissection of left cerebral hemisphere of John Jenkins. 1. Cingulum. 3. Corpus callosum. 5. Polus frontalis. 6. Polus occipitalis.

FIG. VII. Second stage of fibre dissection of Jenkins. 8. Polus frontalis. 9. Polus occipitalis. 1. Fasc. uncinatus proprius 2. Fasc. obliquus fasciculi uncinati. 3. Fasc. verticalis fasciculi uncinati. 4. Fasc. longitudinalis superior. 6a. Fasc. externus fasciculi long. inf. 6b. Fasc. internus fasciculi long. inf. 7. Fasc. perpendicularis (Wernicke). 13. Claustrum et capsule externa. 14. Large additional association bundle. 15. Small additional association bundle.

FIG. VIII. Dorsal view. Third stage of fibre dissection of Jenkins. 8. Polus frontalis. 9. Polus occipitalis. 1. Cingulum. 2. Fasc. occipito-frontalis (Forel). 3. Corpus callosum. 4. Fasc. longitudinalis superior. 14. Large additional association bundle.

FIG. IX. Basal view. Junkins. 8. Polus frontalis. 9. Polus occipitalis. 16. Commissura anterior. 10. Lemniscus temporalis et occipitalis. 17. Pulvinar thalami.

FIG. X. Fourth stage of fibre dissection of Junkins. 8. Polus frontalis. 9. Polus occipitalis. 2. Fasc. obliquus fasciculi uncinati. 3. Fasc. verticalis fasciculi uncinati. 7. Fasc. perpendicularis (Wernicke). 10. Lemniscus temporalis et occipitalis. 11. Radiatio occipito-thalamica. 12. Capsula interna. 13. Claustrum.

on idiots 16 cases of nondevelopment in various forms and in connection with these he writes "nondevelopment is found in various forms, a portion of the cortical substance of the brain may be thin, and instead of following the typical arrangement of the fully developed brain, form a number of irregular folds, which may be so small and numerous as to resemble a mass of angle-worms. Hammerberg<sup>26</sup> found that in every one of nine cases of idiocy he examined a greater or lesser part of the cortex of the brain showed arrest of development, a stage corresponding to either an embryonal period or the period of early infancy.

In many cases of idiocy especially of the microcephalic variety, hereditary degeneracy plays an enormous role and accounts for the developmental defects of large portions of the brain.

Campbell<sup>27</sup> found in 4 out of 13 idiot brains an annectant of the fissure of Rolando on the surface which according to

Cunningham is nothing more than an expression of the remains of a fetal condition.

*In the Constitutionally Immoral.*—In the lower races the temporal, and parietal lobes of the brain are comparatively much better developed than the frontal lobes and correspondingly we find that the animal tendencies nearly unrestrained by inhibitory influences are the ruling factors in their existence. In civilized men the frontal lobes and the upper part of the entire brain are much better developed and that at the expense of the base of the brain, and correspondingly we find that under normal conditions the animal propensities are correspondingly not as great and are under much better control than in savages.

In the constitutionally immoral we find frequently an arrested developmental condition of the occipital lobes as shown by a flat occiput. An arrested development condition of the frontal lobes (the seat of cerebral controlling power) is possibly one of the

most important factors though not always visible to the naked eye. Frequently an arrested development of the entire upper portion of the head shows conclusively that the lower part of the brain is only comparatively better developed than the rest and correspondingly the animal tendencies prevail.

In some cases reversion to a lower type may account for an abnormally large basal development of the brain accompanied by its usual train of symptoms as far as character and conduct are concerned. In another class of cases a subsequent overdevelopment of the temporal lobes and the lateral hemispheres of the cerebellum seems to take place as shown by the large transverse diameter between the temporal regions and the enormous development of the upper and back part of the neck just below the occiput. Cases of this character, most frequently encountered in robust men, are of extremely bad morals. It is peculiar that many of these cases show absolutely no impairment of intelligence and are fully capable of attending to their daily duties, their profession or trade, except that they are absolutely incapable of inhibiting the impulses (desires) from the lower centres of the brain, possibly the sense of "acquiring" from the temporal lobes and "sexuality" from the cerebellum. Many cases of this character hold high and honored positions by displaying extreme cunning in hiding their ill directed passions and in covering their mental defects with the earthly goods with which fortune has favored them.

**In Congenital Prostitutes.**—Judging from the skulls in my collection I may say that they are extremely brachicephalic, nearly round in most instances. The cerebellum is well developed but the occipital lobes being arrested in development do not cover the cerebellum or only sparingly so. The forehead is generally low.

**In Epilepsy.**—That inherited epilepsy is common among anatomical defectives, in other words that congenital epileptics are in many cases anatomical defectives does not need much proof, if we consider the statement of such eminent authorities as Church and Peterson (16). "So commonly is epilepsy presented by neuropathic and psychopathic strains, and in those physically or mentally defective, that in itself it may be considered a presumptive indication of

degeneracy." The same authors remark also: "The hereditary considerations, the usual evidence of degeneracy and the common onset of the disease (?) at developmental epochs all speak of a vicious organization unequal to the shocks of ordinary life and the demands of growth."

Clark and Prout<sup>28</sup> have described widespread changes in the cortical cells, especially of the second layer, consisting of deformities, absence of chromatic substance, and swelling of the nucleoli with tendency to loss of the nucleolus under the section knife.

Bleuler<sup>29</sup> found in 26 epileptic brains widespread hypertrophy of neuroglial bundles lying between the pia and the outermost nerve bundles.

**In the Skull and Brain of the Man of Genius.**—Not having access at the present time to some important original works I have to take Lydston's word for findings which were in all probability taken from Lombroso's *L'homme de Genie*. "The skull of Pascal was abnormal, the principal sutures being fused and indistinguishable. The skulls of Petrarch, Meckel, Donnizetti, Byron and Humboldt showed similar findings. Kant, Bichat and Dante had asymmetric and irregular skulls, Kant's being especially deformed."

As far as the brain is concerned I may refer to what I have stated previously under the heading of "overdevelopment," namely that this condition is most frequent in the higher class of anatomical defectives, especially the genius. This condition mostly shows itself by additional fissures or sulci in certain regions of the brain and correspondingly a relative increase in the number of gyri in these regions. These gyri seem much smaller than the ones of the rest of the brain, but are undoubtedly of a greater complexity as far as their histological composition is concerned. For typical examples in this line I refer to the brain of Gambetta, the great French orator, as described by Chudzinski et Duval<sup>30 31</sup> which showed an especial complexity in the third left frontal convolution, the center of speech. The brain of the great chemist, D. J. Mendelejew<sup>32</sup> showed a very complicated middle frontal gyrus. The brain of Helmholtz<sup>33</sup> might also be mentioned, the frontal lobe of which was so complicated on account of additional sulci

that its typical parts could only be recognized with difficulty.

Genius is in well-nigh every instance partial and limited to the exaltation of a few mental powers and it is only natural that investigators should have attempted to find in these cases abnormal or overdevelopment of certain areas of the brain but up to the present it is only possible to state that "in some instances the relationship between a particular type of mental development and a special part of the brain seem to have been apparent."<sup>34</sup> It should be remembered that overdevelopment does not necessarily reveal itself by an excess of fissures or gyri as brought out by Wagner<sup>35</sup> during the examination of the brains of some famous professors of Göttingen when he states that some of these brains were apparently inferior, as far as their richness in gyri was concerned to the brains of average individuals. Schwalbe<sup>36</sup> suggests that growth of the cortex can take place in thickness as well as in surface and taking into consideration the teachings of Brodmann<sup>36</sup> and Bolton<sup>37</sup> especially the latter who proves histological differences to exist in the thickness of the layers of the cortex due to disease or nondevelopment, we may infer that in the future, minute if not gross (histological) differences as to overdevelopment will be found in cases of this character. In other words, "If under normal conditions, there is exhibited a superabundance of uncontrolled mental energy or function of a particular kind, there must be present an increase in complexity and possibly quantity of the corresponding brain tissue."

To my mind all these findings tend to prove conclusively the presence of an inherited fundamental defect in that part of the nerve forces which rules and regulates the development of the different systems and tissues of the body.

That certain cases of anatomical defectiveness are acquired through injury in one form or another or through abnormal physiological conditions no one can deny, but cases of this kind are rare as compared with hereditary cases.

**The Cardinal Symptom of Anatomical Defectiveness.**—*Conclusive proof by characteristic physical and mental findings of the presence of an inherited fundamental defect in that part of the nerve force which*

*rules and regulates the normal development of the different systems and tissues of the body.*

**Other Symptoms.**—In addition to the physical findings mentioned on a previous page I wish to call attention to the unstable mental equilibrium, the marked selfish instincts, the antisocial tendencies and the changeability of moods which seem characteristic of all anatomical defectives.

**Anatomical Defectives and Their Relation to the Law.**—It would be a sad mistake indeed to suppose for a moment, that the anatomical defective criminal forms the greatest part of the entire class of anatomical defectives. Indeed the greatest part of the entire class consists of people who do not come in conflict with the law, for reasons previously stated, people who are rather of benefit to society than otherwise, as they are mostly capable of managing their own affairs.

Their ideas and works differ greatly from those produced by the mediocre mind on account of an abundance of originality which is mostly lacking in the latter. From this class are recruited individuals endowed with a brilliant intellectuality (by this term I do not understand men with an enormous parrot-like memory, but men that are giants in association) and also the genius<sup>38</sup>; men, without whom rapid progress in all lines of work would be an impossibility; the so-called well-diggers, capable of discovering and getting ready for assimilation by the multitude facts and fundamental laws and rules, which it would take the work-a-day mind centuries to grasp.

The honorable judge and the well trained lawyer both, if they are known as exceptionally brilliant in their line of work frequently upon close examination prove to be anatomical defectives and men of this character, representing the best of the entire class of anatomical defectives are the ones who unknowingly throw the second stone and do their utmost to condemn to death anatomical defective criminals belonging to their species although of a much lower order.

**Anatomical Defective Criminals and Their Relation to the Law.**—It does not seem just that an individual, born under conditions for which he was not responsible, having inherited a certain anatomical make-

up marked by recognizable physical characteristics and mental qualities for which he also is not responsible and educated under unfavorable conditions for which again he is not responsible and which the state permits to exist, should be eliminated by the death-penalty on account of acting perfectly normal according to the anatomical construction and physiological development of his brain.

Anatomical defective criminals can mostly be recognized early as even in infancy man announces the character which will distinguish him in adult age, but after the 16th year they can be recognized without the shadow of a doubt.

As I have stated before the Chicago Medical Society I may state again that "being convinced that in nondiseased criminals there does exist an anatomical basis for crime, and knowing also that criminals of this class (anatomical defective criminals) can not be recognized by juridical and psychological methods only, *I do not hesitate in recommending the ABOLISHMENT OF CAPITAL PUNISHMENT and the erection of special establishments for the perpetual or indefinite seclusion of incorrigible (anatomical defectives) criminals, as is also recommended by Lombroso in Italy, Leveille in France, Minzloff in Russia, May in England, Kraepelin and Lilienthal in Germany, Walberg in Austria, Guillaume in Switzerland, Van Hamel in Holland, Lucas in Portugal and Wines and Wayland in America.*

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## CANCER OF THE RECTUM.

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It is obviously impossible in this short paper to take up an exhaustive consideration of the subject and I shall limit myself to the consideration of the insidious development of this disease and the necessity for the medical man constantly bearing in mind the possibility of malignant disease when interpreting almost any group of rectal symptoms.

Cancer is the most fatal and one of the most painful diseases we have to meet in the rectum. Its exact cause here, as elsewhere in the body, is obscure, and the theories advanced are so much at variance that the writer is not prepared to advocate any opinion. Statisticians and pathologists vary considerably in their reports. Carcinoma of the large bowel is a common disease, but the small intestine is only rarely the primary seat. The large bowel contributes about 95 percent of all cases of cancer of the intestinal canal, and of these the rectum claims 80 per cent. and the colon 15 per cent. Cancer in general is much more common now than formerly but whether this is due to our modern living or is only apparent because of better diagnosis and more careful collection of cases is to be determined. Heredity seems to be an element.

As regards the location of the disease, it is most frequently found about three to five inches within the rectum, the lower limit being on a level with the internal sphincter, next in frequency at the anus, Williams estimates three cases at the anus to forty within the rectum, and least frequently the growth is situated in the upper rectum, or sigmoid. The region extending up from the

internal sphincter is not only the most frequent site, but also the most fatal, for at this point the disease more rapidly runs its course and is more liable to accidents on account of increased anatomical dangers to obstruction.

**Varieties.**—At the anus, epithelioma is nearly always the rule, and is the same form as is so commonly seen on the lip. It begins as a hard, warty nodule at the mucocutaneous border and not within the anus and makes slow progress, for it does not ulcerate until late in its existence, nor does it spread up into the true skin. Microscopically, it contains the characteristic nests of squamous epithelium.

Within the rectum, the cancers belong to the columnar cell growths and resemble the histological structures of the mucous membrane from which they grow. They are adenocarcinomas and closely resemble the benign adenoma; but the glandular hyperplasia of the simple adenoma is restricted to the mucous membrane and grows up into the lumen of the bowel, while the carcinoma infiltrates the submucous tissues and spreads out in all directions. Microscopically the resemblance between the groups of cancer cells and the tubules of the normal gland are so great that the tumor may be mistaken for a benign adenoma, but in the margin of the growth quite atypical cells will be found.

These growths arise above the sphincter and are easily differentiated from the squamous variety. Early in its existence the growth may appear pedunculated. and clinically it is impossible to distinguish from simple adenoma until the tendency toward a broad infiltrating base shows the malignancy. Later ulceration occurs and inflammatory changes are superimposed; all being aggravated by the irritation of the

feces. The cancer varies somewhat in gross and microscopical appearance and also in clinical history, according to the histological structure which predominates in the make-up of the growth. Thus, although the same elements are used, we find encephaloid, scirrhus or melanotic cancer.

The encephaloid cancer arises primarily in the crypts of Lieberkuehn and is enclosed in a connective tissue capsule which sends trabeculae into the mass, dividing it into lobules. The cells are large, round and nucleated. It is often vascular with large veins coursing through it and on its surface. In the interior, extravasations of blood give the tumor a soft, mushy feel and it resembles brain tissue, hence its name, encephaloid, while in other instances it is spongy and shreddy like placenta. Later a large amount of cancer juice containing cells exudes on pressure, and if dropped into water it quickly diffuses, giving the whole a milky appearance. Paget considers this a valuable rough test in diagnosis. If seen early the cancer is movable in the subjacent tissues, but when seen later it is soft and friable upon an indurated base. These cancers grow rapidly and may even fill the whole pelvis, involve surrounding tissues and secondary growths develop in neighboring organs. The glands are involved early and if the tumor is removed it soon recurs, although considerable temporary relief is obtained by its removal and the cachexia disappears for a time. Digital examination is deceptive because of the extreme softness of the tumor and the apparent fluctuation imparted, but a little fluid aspirated will clear all doubt by showing cancer cells and blood. As the deeper structures degenerate they become cystic with a mucoid, glue like, translucent yellow substance, which distends the tissues

and the growth is called alveolar or colloid cancer.

Scirrhus or hard cancer is the variety most frequently met in the rectum. It arises in the submucous connective tissue as a hard nodule beneath the normal mucous membrane and radiates out in various directions, but principally longitudinally up and down the rectum. These new extensions can sometimes be felt as hard bands or processes, claws, from which cancer receives its name. This form of cancer is said to be more frequently on the anterior wall of the rectum near the prostate and infiltrates all surrounding tissues and eventually involves the bladder. The diagnosis of this form is made by its hardness and contractility, but its history is often necessary to differentiate it from simple fibrous stricture of the bowels. Kelsey reports a case of dysenteric diarrhea which resulted in a stricture and presented a typical clinical picture of scirrhus cancer, but had existed eighteen years. In the scirrhus variety the stroma is abundant and the alveoli narrow with the cancer cells frequently small. Fatty degeneration of the cells often occurs and the stroma remains to contract. Secondary metastatic growths occur late and there is hope of a cure by early and thorough excision.

Melanotic cancer is placed among the carcinomas by some pathologists and by others among the sarcomas. It is soft and medullated and has increased development of pigment. It is rapid and malignant in growth and often becomes generalized. Only ten cases have been reported, and only six had complete histories. Five were men and one a woman. The ages varied from forty-five to sixty-four. Microscopical examinations were made in five cases and these were all classed as sarcomas. The symptomatology was the same as any rectal cancer with the

exception of one case where the stools were black, and also after making an examination the finger was blackened.

**Symptoms.**—Cancer of the rectum begins insidiously and often gains such development before the patient is aware of its significance that it is beyond hope of complete cure. He thinks he has hemorrhoids or some other simple rectal ailment and dismisses it from his mind because he objects to an examination. The mild character of the symptoms for some time is peculiar to cancer situated above the middle of the internal sphincter, because the bowel has so little sensitiveness that considerable growth and even ulceration may exist without causing much if any uneasiness. However, when the disease is below the sphincter there is great pain and the suffering itself may be of assistance in making an early diagnosis. In all cases, very early in the history of the disease, there is an uneasiness in the rectum which grows worse each time the bowels move as though they had not completely emptied. There is also a bearing down and if the disease is near the anus this straining is sometimes violent.

The pain of rectal cancer is variable. Early in the disease it is usually not severe but later it is often intense and is the most important symptom to be treated. If the anus is eroded, the pain is similar to that of irritable ulcer or fissure and begins as early as the growth pushes through the mucous membrane. Pain or cramp in the lower extremities is a bad sign, for it suggests encroachment on neighboring nerves either by stretching or pressure of the cancerous mass itself or of the infected glands. Later pain also occurs from irritation of the feces upon the ulcerated surface, especially when the anus is ulcerated. Each condition must

be carefully diagnosed as each requires special treatment.

Slight morning diarrhea or rather several movements consisting of mucus and feces is the first inconvenience noticed. Later a sanguous discharge containing shreds of broken down growth escapes, at first only during defecation but later as the sphincters lose their usefulness, more or less continually and excoriates the anus and skin about the parts. This discharge has the odor of decayed flesh and once recognized is never forgotten. It is similar to the odor of cancer of the uterus.

The ulcerations of the cancer that produce the fetid discharge are of two kinds, that above the stricture and that of the growth itself. Ulceration developing above the growth differs from the cancerous necrosis in that it is superficial in depth, has a clean smooth base and low even edges. It results from pressure of, and toxines absorbed from, the retained and hardened feces that are lodged in the dilated portion of the rectum immediately above the obstruction. When the obstruction is relieved, these masses are found to be dry and almost stony in hardness and seem imbedded in the tissues and if removed leave ulcerated spaces beneath them.

The ulceration of degenerated cancerous tissue is different. Early in the disease the normal mucous membrane is movable over the growth but the cancer soon breaks down; this degeneration may occur at one or several places simultaneously and the mucous membrane is honeycombed with ulcerating spots through some of which the cancerous mass may protrude. Ulceration begins at the central or denser parts of the cancer and is not limited to the superimposed mucous membrane but invades the deeper structures and in some cases extends

into neighboring organs. The bladder is frequently opened and a urinary fistula produced, the urine escaping through the rectum, and sometimes the feces are forced into the bladder and through the urethra, causing excruciating pain. This is one of the most urgent indications for colotomy. The prostate or seminal vesicles in the male or the rectovaginal septum in the female may be destroyed. When the prostate or urethra are involved obstruction to urination begins, and if the disease extends to the bladder wall cystitis develops. Smith records a case where the disease opened into the hip joint. While the center is degenerating the periphery is advancing into new tissues. Around the edges the growth, together with the inflammatory reaction, raises the borders and gives the ulcer a crater-like appearance. The muscular tissue seems to have a greater resisting power and prevents somewhat the extension of the ulcerative process. The extension, however, progresses irregularly and creates a ragged edge.

Hemorrhage from cancer occurs frequently but is seldom profuse enough to be dangerous, although anemia produced by the repeated loss may be an element in hastening the end.

Obstruction is variable in its symptoms, sometimes advanced scirrhus cancer which has narrowed the lumen of the bowel until it will hardly admit the end of the finger will cause little or no obstruction. Not infrequently the passage of feces is never much interfered with, because ulceration begins early and the growth sloughs off enough to keep the passage open. When obstruction exists and is located in the lower rectum or at the anus, the feces are ribbon-like in shape or small pea-like balls or else the frequent efforts at defecation bring away small amounts of feces mixed with

mucopus and resembling a diarrhea. Blood is frequently mixed with the feces, suggesting a dysentery instead of the real disease. Ulceration into the surrounding tissues with the production of an abscess and fistula allows the extravasation of feces and often a large dissecting abscess. The obstruction when present is similar to that of simple stricture and not in any way pathognomonic of cancer. The patient's history does not differentiate the disease and all depends on a physical examination which requires great care and delicacy.

Cancer in this region is of rapid growth and if a patient asserts the stricture has existed for many years it is evidently not malignant although it must be remembered that carcinoma may be engrafted upon any benign growth of ulceration.

**Examination.**—Digital examination is of great value in all rectal strictures and in cancer it is absolutely necessary because here a hard nodular mass will be found which involves perhaps only one side of the rectum, while the other side is covered with normal mucous membrane; or the mass may encircle the rectum leaving only a small opening in the middle. Its peculiar character on palpation is a hard, rough, irregular mass projecting into the rectum, easily differentiating it from simple stricture which is smooth, or a tubercular stricture which undermines surrounding areas.

Ulceration will probably be found in all cancer cases or at best with few exceptions, because they are rarely seen before this stage. Irregular masses appear to have been broken off roughly. Raised edges surround the ulcer and give it the crater-like appearance. The finger being well anointed and inserted feels this rough irregular edge all around the constriction and then suddenly passes into a wider channel above where

frequently masses of hardened feces are found. Exceptionally, a softer polypoid mass (encephaloid cancer) is found simulating a benign adenoma but having a broad base which infiltrates the submucous tissue. Every possible care must be taken in passing the finger through the obstruction where it surrounds the rectum, especially if near the peritoneal surfaces for fear of tearing through the friable wall and entering the abdomen. The necrosis may leave a very thin partition at some one point or the ulceration in the bowel above the obstruction may be very deep. The finger must never be pushed hurriedly through a carcinomatous stricture and even soft bougies must be used with great caution. Numerous cases of rupture and sudden death have resulted from carelessness in making an examination.

Cachexia appears earlier in cancer of the rectum than when the disease appears in other parts of the body, probably because of the ulceration, and breaking down of tissue produces a constant absorption of toxines and septic matter, which brings on an emaciation even when there are few or no local symptoms. Metastatic growths in the liver, lungs, kidneys and other organs, of course, accelerate the general breakdown. However, in some cases, the appearance of vigorous health is maintained until late in the disease; any case of gradually developing obstruction of the bowel with progressive loss of weight and strength in a middle-aged person is always suspicious, especially if inquiry brings out a history of constipation or spurious diarrhea. Lymphatic enlargement is a valuable sign and may generally be found if properly sought for.

There are, however, two sets of lymphatics involved in this region. One set arising from the anus and surrounding in-

tegument terminates in the glands in the groin while those from the rectum proper end in the sacral and lumbar glands. Therefore in disease within the rectum the infected glands are to be palpated along the spinal column and deep in the pelvis because unless the external parts are involved the inguinal glands may be nearly or quite normal and a thorough examination of the deep systems will determine the advisability of operation or only palliative treatment. Another point in diagnosis is that these enlarged glands or the cancer mass itself may produce pressure symptoms in parts quite distant or independent of the rectum. Pressure on the iliac vein will cause edema of the legs, a condition that occurs frequently in the later stages of the disease.

This gives the reader a general picture of the clinical features of cancer as found in the lower part of the large bowel, and the object of this article is to set out prominently such symptoms as will assist in a clear and early comprehension of this dread disease. What course of treatment shall be adopted depends on many things, which of the symptoms are most prominent, the position and extent of the growth and the involvement of other and perhaps vitally necessary organs. Upon these the surgeon must decide whether his treatment shall be removal with a hope of lengthening life and perhaps curing the patient, or shall it be simply alleviation of suffering. If the entire mass and sufficient perirectal tissue can be removed, the prognosis is relatively good, but in advanced cases the prognosis is bad, regardless of the operation.

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**Endocarditis.**—Rest is the main factor in treating an active endocarditis.—*Exchange.*

## DEMENTIA PRECOX STUDIES—THE TREATMENT OF THE TOXEMIA OF DEMENTIA PRECOX.

BY

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With the interpretation of our researches and the clinical history of dementia precox the treatment should be approached from two directions.

In the first place the condition of spasmophilia should be relieved by the method found useful in similar conditions until by empirical successes a method for this disease is demonstrated. The addition of lime- and magnesia-containing foods and drinks are certainly indicated. Spasm of the pylorus in children should be studied for parallelisms. There is no suggestion in any evidence which has come to my knowledge of the cause of the spasm of the sphincter of the colon, (Cannon's sphincter), therefore there is no indication at hand for any treatment specifically to meet this primary fault, if it is primary as we suppose. Beyond diminishing the systemic spasmophilia we can suggest no treatment. The fluoroscopists use enormous doses of belladonna to distinguish spastic conditions of the intestine from scar, carcinoma, or other contractions. This has not, so far, been reported in dementia precox, and I have not had the courage to try it.

In the second place, the toxemia should be counteracted and the further production of toxins prevented. Since the toxin is produced in the cases studied by me, and on which the conception of the disease presented in my paper in the July AMERICAN MEDICINE depend, in the retarded cecal contents, it has seemed to me that our first duty in this condition is to accelerate the empty-

ing of the cecum and secondarily to antidote, neutralize, or destroy the toxin. If we assume, as I have done, without the necessary supporting evidence that the venomous betainimazoleethylamine is a great factor in this disease, and that it is produced in the cecum by the growth of the colon bacillus in a nutrient media containing the amino acid, histidin. Then remembering that histidin with nineteen other amino acids is poured into the cecum four hours after each meal, it seems indubitably indicated to empty the cecum not later than six hours after each meal by the simplest method conceivable. To me the simplest method of positively meeting this indication is by the production of an appendicostomy for timely irrigation of the cecum through the colon.

The technique of appendicostomy was developed for the treatment of amebic dysentery, but these patients were all sane and many of them bed-ridden. The technique for dementia precox patients must be modified to meet the requirements of the mental condition.

The anesthetic can rarely be local. Only in stuporous patients can the operation be done with novocain. The patients cannot be expected to cooperate with the operator. Many dementia precox patients take any general anesthetic badly and are prone to stop breathing if ether is pressed too rapidly. Nearly all dementia precox patients are better, more rational, and have a higher blood-pressure for two weeks after a moderately prolonged ether anesthesia. Ether, then, is the anesthetic to be carefully given. Chloroform is contraindicated though I know of no record of the death of a dementia precox patient from chloroform anesthesia.<sup>1</sup>

The attempt should be made to secure the appendix through as small an incision

as possible, so that if the patient becomes disturbed he can do as little damage as possible to the field of operation. For the same reason no tube should be left in the appendix. The cecum should be firmly attached to the parietal peritoneum by two or three catgut stitches. If the abdominal wall is thin, as it usually is, the mesentery of the appendix should be ligated off to a point about half an inch, or the thickness of the abdominal wall, above the valve of Gerlach. The peritoneum should now be closed with a continuous catgut suture taking *great care not to constrict the appendix and its mesentery*. The appendix is now carefully sewed into one side of the wound by two or three *etage* sutures, to the muscles and the fascia. Each layer is now closed with equal care not to constrict the appendix which should be carried obliquely through the different layers. The several layers of fascia are now all closed with catgut stitches, the skin closed with silk-worm gut, and the appendix sewed carefully to the skin with silk. The appendix is now cut off as it protrudes through the skin and with catgut stitches the mucosa and peritoneal surfaces are whipped into close apposition. In a few days union will be complete and a new opening will be established into the alimentary canal. There will be no discharge of fecal matter and only a small dressing will be required to take up the mucous discharges.

In very sick patients the irrigations may begin at once. Six ounces of a saturated solution of magnesia sulphate can be injected into the cecum with a fountain syringe and a small catheter before the patient has come out of the anesthetic. This is not necessary and I, personally, prefer to wait until the wound is healed and then carefully pass a catheter into the cecum and allow the solution to pass into the cecum from a height

of two and a half feet at a temperature of 105° F. until four quarts have passed. The patient during all this time can be sitting on the stool and passing the contents of the rectum into the bowl as it fills from the colon. The flow into the cecum is interrupted by an occasional contraction of the cecum. This irrigation takes twenty minutes.

The time of the irrigation seems to be fixed at bed-time by researches, and as long after the last meal of the day as fluoroscopy has shown it takes the barium meal to enter the cecum. This may be set at six hours after the evening meal at farthest, when no fluoroscopy has been done.

The solution which seems indicated is composed of half a cake of dry yeast, ground up in a teacup of water and strained through a bit of cheese cloth into four quarts of water, temperature 104° F. in which half an ounce of glucose (corn syrup) has been dissolved. Other solutions may be found better or more desirable but this one is designed to deaminize any existing histamin and by symbiosis prevent the formation of this toxin by the growth of the colon bacilli during the night on any remnants of histidin which come into the cecum after the irrigation is finished.<sup>1</sup>

The opening of the cecum could well be used for the study of its contents. With a Sprengel pump the contents of the cecum could be removed during any hour after any test meal. The histidin could readily be estimated and one question of great moment could be answered. Are the conditions for the formation of histamin, which we have premised, existing, or is all the histamin shed

<sup>1</sup> When rats have been fed on food containing the form of colon bacillus known as the *B. aminophilus intestinalis*, *B. & B.* with *B. prodigiosus*, they die in six days, but if yeast is constantly added to their food the rats live. See page 25 in Barger, George, *The Simpler Natural Bases*. 1914, Longmans, Green & Co., 215 pp.

from the mucosa of the small intestine in which it was found by Barger and Dale<sup>2</sup>? If the contents removed from the cecum are free from histamin and rich in histidin, if, after incubation of the same, the histamin appears in the course of six to ten hours at a temperature of 37° C., then my thesis is sustained. At present my resources do not permit me to carry out this investigation with my own patients.

The value of these irrigations ought to be demonstrated by the changing condition of the corpuscular elements of the blood, by the hemoglobin estimations, and by the return of blood-pressure to normal. It is uncertain whether we can expect the pharmacologic reactions to adrenalin and other drugs to become normal or not. In time the adrenalin paradoxes ought to disappear. In the case of Leo Phillips, who seemed to have made a perfect mental recovery after ten years of an indubitable dementia precox, there was no histamin in the stool and there were no adrenalin paradoxes.

As the investigations of the cecum continue one might hardly expect the defensive ferments to disappear from the blood. Even when added to the blood of animals by the injection of serum from man they remain for several months. In the case of Leo Phillips they were present ten years after apparent recovery. If the blood presents a normal picture after a few months treatment the presence of the defensive ferment for testicle and ovary should not be considered discouraging.

The return of living spermatozoa in the semen would probably be a most encouraging sign. In the case of Leo Phillips, who was strong, well, apparently very rational, and with perfect sexual phenomena so far as could be discovered, there were no living spermatozoa in the semen examined immedi-

ately after natural discharge. This young man had a regular love affair with frequent intercourse for nearly a year with a vigorous young woman who had no gonorrhea and used no precautions and yet did not become pregnant. Two patients who have submitted to appendicostomy recently are apparently improved. Their blood pressure has risen from 80-90 to 118-124 mm.

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#### RENAL CALCULUS.

BY

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The subject of renal calculus is always interesting, especially to the general practitioner, who is usually first consulted by the patient during an attack of acute (so-called) nephritic colic, and must immediately institute measures to secure relief.

The pain accompanying the passage of even a small irregularly shaped calculus from the kidney pelvis, thence through the ureteral lumen to the urinary bladder, may be so excruciating as to induce profound shock which may persist for a longer or shorter period, depending upon the severity and duration of the attack. Pain usually begins suddenly, is most intense over the kidney region, and during descent of the calculus may sometimes be traced along the course of the ureter, as was possible in one case which recently came under my observation. Pain is oftentimes reflected toward the groin, the thigh, the lumbar region, the

genital organs, etc. Vesical irritation is frequently noted, and if the stone is sharp-pointed, thus causing laceration of the ureteral mucosa, blood in considerable quantity may appear in the urine. There is sudden subsidence of pain when the calculus reaches the urinary bladder, and excepting a sensation of soreness in the kidney region, the patient experiences no further discomfort unless the advent of an additional calculus causes a repetition of the symptoms. Renal calculi are multiple in about fifty per cent. of the cases.

If the calculus is too large to traverse the ureteral lumen, its lodgment in the reno-ureteral orifice may cause severe pain from obstruction to the urinary outflow, and consequent distension of the kidney pelvis. Under such circumstances pain is intermittent in character, subsiding when the calculus recedes into the renal pelvis, and followed by the passage of an unusual quantity of urine which has accumulated during the temporary obstruction. The attacks of pain may recur at intervals of weeks or months, and may persist for an indefinite period; but as a rule, acute suffering is of shorter duration than when the calculus is sufficiently small to traverse the ureteral lumen without causing marked obstruction.

In nearly all cases of nephritic colic, blood is noted in the urine, either macroscopically or microscopically, and albumin is commonly also present. The trauma incident to the passage of an irregular stone through the ureteral lumen furnishes a reasonable explanation of the origin of slight hemorrhage, but when the calculus merely lodges in the reno-ureteral orifice causing temporary obstruction to the urinary outflow, the source of the bleeding is more difficult of understanding. In a small percentage of instances of undoubted renal

and ureteral calculi, neither pain nor hematuria is at any time a prominent symptom. Where infection of the upper urinary tract ensues, other characteristic manifestations supervene.

In the event the calculus becomes impacted in the ureteral lumen, as not infrequently happens, hydronephrosis, pyonephrosis or anuria may occur. In permanent and complete obstruction, however, atrophy of the kidney rather than hydronephrosis is the rule; that is to say, partial or temporary ureteral stenosis from any cause eventuates in either anuria, hydro- or pyonephrosis, whereas complete and permanent obstruction results in atrophy with consequent cessation of kidney function. Where pain and hematuria are not concomitant factors, the pathology may remain unsuspected, provided the opposite kidney possesses normal functioning capacity.

Rarely a long-standing impacted calculus may cause ulceration and perforation of the ureteral walls, and as infection has probably already ensued, the production of a lumbar or pelvic abscess is the logical ultimate outcome.

A positive early diagnosis of renal calculus is sometimes impracticable based upon the clinical symptoms alone—especially in atypical cases—and resort must be had to mechanical measures, consisting of the x-ray, cystoscopy with ureteral catheterization, and pyelography. By the employment of these aids accuracy in diagnosis is assured in nearly all cases, although the information obtained by the x-ray alone may sometimes be deceptive and misleading. In rare instances ureteral catheterization may be impossible. In a recently observed case, based upon the clinical signs a diagnosis of renal calculus was made, yet confirmation could not be secured by either the x-ray or

ureteral catheter. In certain cases the location or composition of the calculi may be such that no shadows are shown upon the x-ray plate, and when situated within the kidney of course detection is impossible by means of the ureteral catheter. Pathological changes within the renal pelvis, which may be productive of symptoms simulating those due to calculi, can usually be determined by pyelography according to methods recommended by Braasch and others.

In every case of suspected renal or ureteral calculus, it is important that the clinical findings be supplemented by radiography and ureteral catheterization. In the majority of instances the clinical diagnosis will be verified or disproven by these mechanical aids, and upon the results thus obtained must be predicated the rationale of treatment.

From the standpoint of the general practitioner there are some interesting features in connection with the treatment of renal calculus. As the patient is usually first observed during an attack of acute suffering, the primary indication is to relieve pain. This may usually be accomplished by the hypodermic administration of morphine. The inhalation of ether or chloroform may be necessary in certain cases where pain is particularly severe and cannot be controlled with opiates. This was true in one of my cases. A hot general bath and hot local applications may also be productive of beneficial effects. Free diuresis should be obtained as soon as possible by the administration of suitable drugs, such as urotropin, sodium benzoate, atropine, etc. Spirits of turpentine and fluid extract of hydrangea are sometimes useful. Medicinal treatment is of especial importance in cases where infection of the upper urinary tract has

supervened. "Flushing" the kidney by the ingestion of large amounts of distilled water may assist in the passage of small calculi or calculous debris through the ureteral lumen to the urinary bladder.

The idea that large definitely formed calculi can actually be dissolved within the kidney by the internal administration of drugs has long since been proven a delusion, yet there are physicians who still adhere to such fallacious beliefs. So far as is known there is at present no remedy the internal administration of which will cause certain disintegration of large calculous deposits located anywhere within the human body, although there may be chemical agents which will accomplish that result in the test tube. So far as renal calculi are concerned, if accurate early diagnosis could be made, i. e., during the stage of formation and while the concretions were still friable, further softening and expulsion might be facilitated by the exhibition of diuretic and so-called solvent drugs. However, as the patient does not usually seek medical aid until late in the history of the affection, when calculi have probably definitely formed and attained considerable size, medicinal treatment must be considered palliative rather than curative.

The suggestion cannot be too strongly emphasized that, when the clinical diagnosis of renal or urethral calculus has been verified by employment of the mechanical measures as already described, the lesion should thereafter be considered surgical rather than medical in character. The surgical treatment consists in removal of the calculi and relief of the obstruction. The method of procedure will depend largely upon the size and location of the calculi, and although this is not a surgical contribution,

the following suggestions may be permissible:

(1) Where calculi exist within the renal pelvis, or are impacted in the ureter near the uretero-renal orifice, removal may be successfully accomplished by pyelotomy:

(2) Calculi impacted in the mid-portion of the ureter may sometimes be dislodged by introduction of the ureteral catheter with injection of oil, glycerine, etc., otherwise laparotomy and ureterotomy will usually be required to overcome the obstruction:

(3) Where calculi are located near the uretero-vesical orifice, extrusion may be facilitated by injections of oil through the ureteral catheter, but should failure attend this simple procedure, removal may be accomplished through the operating cystoscope.

The subjoined case reports are offered as representing totally different types of the affection, and to illustrate the difficulties sometimes encountered by the general practitioner in the management of such cases. In each of these instances the diagnosis was based primarily upon the clinical manifestations. In one use of the x-ray and ureteral catheter was not permitted as a means of confirming the clinical diagnosis. In the other both these diagnostic aids were employed, but verification of the diagnosis was not thereby secured.

*Case 1.*—A male, aged forty-five years, gave the history of having previously enjoyed vigorous general health. He was a large, robust looking man, the proprietor of a small mercantile business. While sweeping his store early one morning, he was suddenly seized with most excruciating pain in his right side, and was carried home in a semiconscious state. When seen by me about an hour later he had rallied, and was immediately given a hypodermatic injection of morphine  $\frac{1}{4}$  grain with atropine  $\frac{1}{150}$  grain, the dose being repeated within forty minutes. No relief was secured from the morphine, and hot (wet) packs were also applied to the kidney region without benefit. Pain was so intense that the patient had to be kept under the influence of chloroform

for the first few hours, after which a fair degree of comfort was maintained by frequent doses of opiates. Urotropin, sodium benzoate and atropine were administered internally at frequent intervals throughout the day, in the hope of securing prompt diuresis and to assist in passage of the calculus, but little effect was noted. The urine voided was about normal in quantity, and considerable macroscopic blood was present after the first day. The remedies mentioned were continued, and free diuresis began the morning of the second day of treatment.

The pain from which this patient suffered during the first day of the attack was the most severe that I have ever witnessed in nephritic colic. It began in the kidney region and could be traced by the subjective evidence downward along the course of the ureter as descent of the calculus occurred. Pain continued with but few intermissions for five days. On the second day consultation was requested, but the patient stated "that he did not believe much in doctors, and if I could relieve the pain that was all he wanted!" He refused to permit the use of the x-ray and also the ureteral catheter.

The pain suddenly subsided on the fifth day, and was followed by the passage of a large amount of bloody urine, indicating that some ureteral obstruction had occurred. The calculus evidently passed into the urinary bladder, but was not found in the urine, nor would the patient permit use of the cystoscope.

During the first day while the pain was most severe, the temperature reached 101°-102° F., but subsided to normal before the fifth day. There was evidently no infection of the urinary tract. The urine became clear eight days after the onset of the attack, and the quantity voided was normal. The patient then went to French Lick Springs, Indiana, and remained there six weeks. Since returning to Louisville and resuming his occupation there has been no recurrence of pain nor hematuria.

*Case 2.*—A female, aged forty, mother of five children; no history of previous illness. For about a week the patient had suffered from almost continuous pain in the right kidney region, and when macroscopical blood was noted in the urine, she came under my observation. The frequency of

micturition was increased, the quantity voided being about normal. Urinalysis showed small amount of albumin.

Based upon the foregoing clinical data the diagnosis of renal calculus was made and the patient treated accordingly. At times during the next few weeks the urine would become almost clear, but pain continued and the hematuria recurred from time to time. Vesical lavage was practiced upon several occasions, but no improvement was noted following such treatment. It was demonstrated by cystoscopy and ureteral catheterization that the blood came from the right ureter. The catheter was apparently introduced to the renal pelvis without meeting any obstruction, and both ureteral orifices presented a normal appearance.

About this time two prominent Louisville physicians were asked to see the patient in consultation. Careful radiographic examination revealed no calculi in either the renal pelves or the ureters. The urine was examined on ten different occasions at the Louisville Research Laboratory, and no tubercle bacilli found. The pain and intermittent hematuria continued, and the patient was sent to the hospital where permission was obtained to perform an exploratory operation. The right kidney was accordingly exposed, incised and palpated. While no calculi were discovered the kidney appeared markedly congested and hyperplastic. The incision was closed without drainage. The patient left the operating table in good condition, and was discharged from the hospital within three weeks with the wound healed.

The urine remained comparatively free from blood for about a month after the operation. The intermittent hematuria then recurred, but the bleeding was much less than formerly, and the patient stated she suffered much less pain in the kidney region than before the operation. She has remained well and the urine is now comparatively clear.

A brief retrospective study of these two cases may not be devoid of interest. In case one the attack of pain developed suddenly in a man who had previously enjoyed excellent health, and was typical of nephritic colic. While the clinical diagnosis of renal

calculus was unconfirmed by mechanical means, there can be no question as to its correctness. Ureteral obstruction was incomplete, the calculus being sufficiently small to traverse the ureteral lumen, and when it escaped into the urinary bladder the symptoms subsided.

About a year has now elapsed, and as there have been no further attacks, it seems reasonable to presume that the patient has been permanently relieved.

In case two it was impossible to verify the clinical diagnosis of renal calculus by radiography and ureteral catheterization, and while this does not necessarily signify that an error was made, correctness of the conclusion reached may be questioned. It is recognized that renal pain and intermittent hematuria may occur from other than calculous lesions, both tuberculosis and renal varix having been known to produce such effects. In this instance, however, tuberculosis was excluded, and while renal varix might cause intermittent hematuria, in the absence of ureteral obstruction and distension of the kidney pelvis, pain would not likely be a concomitant factor. There was no obstruction to the urinary outflow, nor was stenosis evident upon introduction of the ureteral catheter. Radiography revealed no shadows in either the kidney pelves or the ureters, nor were any calculi discovered by palpation after the kidney had been incised.

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**Chronic Constipation.**—Linseed or flaxseed is recommended, (Kohnstamm and Openheimer, *Therapic der Gegenwart*, September, 1915), one or two ounces stewed in soup or with fruit. The flaxseeds must not be chewed, but swallowed whole. Their content of mucilage makes the feces more bulky and slippery and thus facilitates comfortable movements of the bowels. The flaxseeds do not cause irritation.

## TUBERCULOUS PERITONITIS IN YOUNG CHILDREN.

BY

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Owing to the frequency with which abdominal enlargement is met in young children, especially as a result of dyspepsia and rachitis, it is not at all uncommon to find quite a large number of cases of tuberculous peritonitis which were overlooked until they reached very advanced stages. This is very unfortunate, since tuberculous peritonitis if treated surgically early is practically curable. An attempt therefore will here be made to emphasize the characteristic symptoms of the disease and its differential points from similar affections in order to facilitate an early diagnosis.

Tuberculous peritonitis is most commonly met with in children from three to six years old, but neither younger nor older children are exempt from it. Judging from the fact that among the forty-six cases under my observation nine were under two years of age I am inclined to believe that a great many infants succumb to this disease before a correct diagnosis is arrived at. For, as is well known, tuberculous peritonitis not rarely pursues an acute or subacute course with chills, high fever, nausea, vomiting and acute abdominal pain, and ends fatally in a few weeks. Of course, the classical variety of this affection is the chronic form. In the majority of instances it sets in insidiously, with symptoms of dyspepsia, anemia, moderate evening rise of temperature, accelerated respiration and pulse, frequent attacks of colic, and more or less pronounced diarrhea. On examination

the abdomen is found greatly distended, and its wall often glistening and traversed by blue lines, the epigastric veins. The umbilicus is either effaced or protuberant. The extremities are usually emaciated and contrast strongly with the gradually enlarging abdomen. Palpation reveals that the consistence of the abdomen is not uniform throughout. Occasionally hard cord-

FIG. 1. Tuberculous peritonitis.

like, painful masses and thickened omentum or adherent intestinal loops, and, more rarely, large tumors and encapsulated abscesses are detected. The latter if situated near the navel (perumbilical tuberculous abscess) may open and discharge through the umbilicus, but instead of the disease healing spontaneously, the abdominal enlargement usually persists, or, after the es-

cape of the fluid and formation of fibrous adhesions, the abdomen retracts, becomes tray-shaped and remains so until exitus. Percussion usually confirms the findings on palpation. Thus, some portions of the abdomen are flat on percussion, eliciting the presence of fluid or nodular masses, other portions again are tympanitic, indicating that the abdominal enlargement is due to intestinal fermentation. As in all forms of tuberculosis here too a positive tuberculin reaction is corroborative of the diagnosis.

diagnosis between the two afflictions presents considerable difficulty. In such cases a positive tuberculin reaction is decisive in the diagnosis. Moreover, in rachitis percussion of the abdomen reveals uniform tympanites and palpation fails to elicitropy nodules or masses as is often the case in peritonitis. I wish to call particular attention to a physical sign which has proved

FIG. 2. Rachitis.

It is well, however, to bear in mind, that a negative result by no means proves the absence of tuberculous peritonitis, more especially when the case is far advanced.

Tuberculous peritonitis in young children is most apt to be confounded with: rachitis, anemia pseudoleukemica infantum, (*Von Jaksch*), sarcoma of the kidney and primary family splenohepatomegaly (*Gouger*). Owing to the frequent coincidence of tuberculosis and rachitis in babies, the differential

FIG. 3. Von Jaksch's anemia.

helpful to me in differentiating abdominal enlargement associated with rachitis from that of tuberculous peritonitis, namely: Whereas in rachitis the greatest prominence of the abdomen is manifested at the epigastrium, in tuberculous peritonitis the abdominal protuberance is largest at or below the umbilicus (hypogastrium). This dif-

ferential physical sign is best determined by careful measurements of the abdominal circumference at the aforementioned anatomic situations, but it can readily be perceived on mere inspection. This sign can be traced to the fact that in tuberculous peritonitis the inflammatory exudate accumulates at the bottom of the abdominal

markedly enlarged and usually readily palpable. The tuberculin reaction is negative and the temperature is not elevated. Emaciation if present is slight and the disease usually yields promptly to fresh air, good food and iron and arsenic. The blood picture of the disease is not sufficiently characteristic to serve as a differential sign from

FIG. 4. Sarcoma of the kidney.

cavity and thus distends the surrounding abdominal wall. To make correct use of this sign we must be sure to exclude ascites, large dermoid cysts of the ovary and an overdistended bladder, the latter condition particularly being apt to lead to diagnostic errors.

In Von Jaksch's anemia the spleen is

tuberculous peritonitis, since the latter affection also is associated with secondary anemia which greatly resembles anemia pseudoleukemica infantum.

In the early stages there is considerable difficulty to distinguish tuberculous peritonitis from sarcoma of the kidney. In both affections the abdomen is irregularly

enlarged, emaciation pronounced, and the course very protracted. But in renal sarcoma the tumor can readily be palpated, if need be under anesthesia, and also demonstrated by means of the Roentgen rays. Furthermore, the tuberculin reaction is negative. Blood in the urine may be de-

type) and finding that so little if anything is being said about it in ordinary text books, I think it opportune to emphasize that it is a primary congenital affection occurring in several members of the same family and usually overlooked in early infancy. When noted it is generally attributed to rachitis, pseudoleukemia, tuberculosis or syphilis, but the blood examination shows no definite pathological picture, and the Wassermann and tuberculin reactions are negative. As the child gets older the spleen and liver assume extraordinarily large dimensions, often occupying the entire abdominal cavity. It is also associated with occasional hemorrhages from the nose and throat, pigmentation of the skin, but is free from fever and pronounced emaciation that is characteristic of the late stages of tuberculous peritonitis. In the early stage of splenohepatomegaly, when the diagnosis is most difficult our chief reliance must be based upon the negative tuberculin reaction, undue palpability of the spleen and liver, and absence of fluid in the abdominal cavity. Careful inquiry into the family history is often very helpful.

127 West 87th St.

FIG. 5. Primary family splenohepatomegaly.

tected in both diseases, hence unreliable as a differential sign.

Having had occasion<sup>1</sup> to observe several cases of splenohepatomegaly (Gaucher

Iodin for Typhoid Carriers.—Kalberlah (*Medizinische Klinik*) says that iodin in combination with charcoal will free stools from typhoid bacilli very promptly. He gives from 8 to 15 minims of tincture of iodin in a glass of water from three to five times a day, wood charcoal in teaspoonful doses being given at the same intervals. In five cases in which this method was tried the bacilli promptly disappeared from the stools and did not return during a period of four months, examinations of the stools being made at five-day intervals. Discharge of bacilli in the urine may continue for a considerable period, but this can be speedily arrested by the administration of hexamethylenamin.

<sup>1</sup>Med. Record Nov. 4, 1911. Arch. Diagnosis July, 1914.

## THE COMMUNICABILITY OF ACUTE POLIOMYELITIS; ITS SPREAD AND CONTROL.<sup>1</sup>

BY

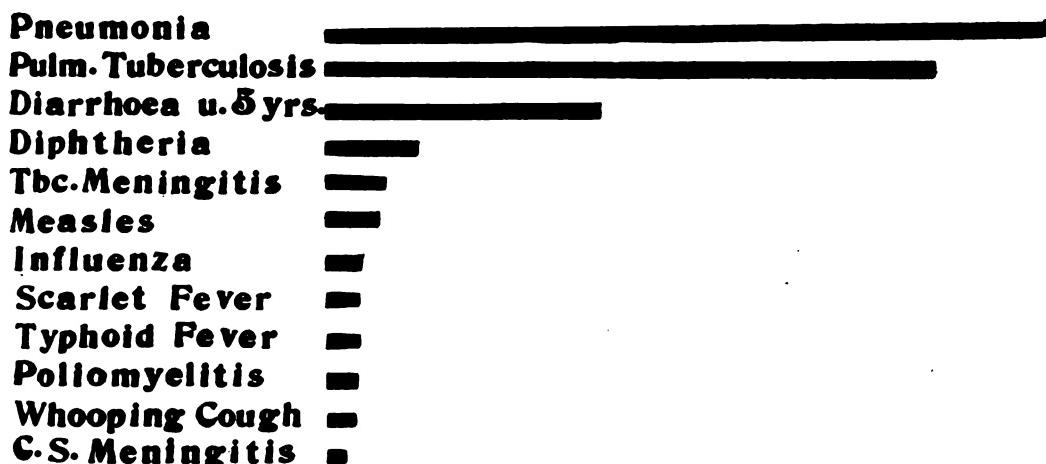
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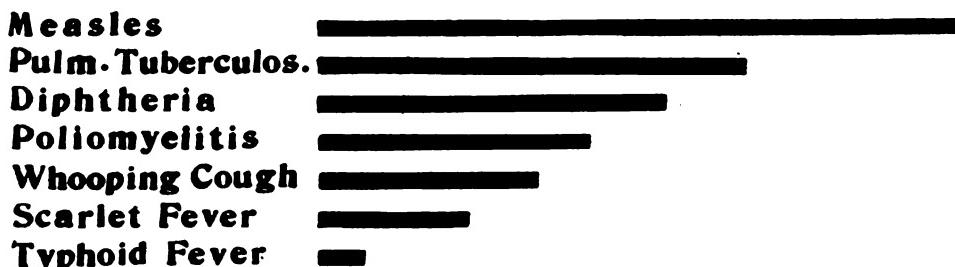
Now that we have regained our mental equilibrium, we are in a position to discuss

sider the relative morbidity and mortality of poliomyelitis and some of the other communicable diseases. In chart 1, I have represented graphically the deaths from these diseases in New York City during the last five years; and it will be seen at a glance that as compared with pneumonia and pulmonary tuberculosis, the deaths from poliomyelitis dwindle into insignifi-

**Deaths New York City, Jan. 1, 1911-Oct. 1, 1916**  
**Thousand 10 20 30 40 50**



**Cases Reported New York City, Jan. 1.—Oct. 1, 1916**  
**Thousand 5 10 15 20**



this subject calmly and deliberately. In order to obtain a proper sense of proportion it will be well at the outset to briefly con-

cance; about 26 times as many are due to pneumonia and about 22 times as many to pulmonary tuberculosis. The number of deaths from tuberculous meningitis is interesting, because this disease affects young

<sup>1</sup> Read before the Medical Society of the Borough of the Bronx, Oct. 11, 1916.

children almost exclusively, the mortality is practically 100 percent.; and it is a disease which is to a great extent preventable; and still it has received no special attention. In the lower part of the chart, I have represented graphically the number of cases of some of the communicable diseases reported during the first nine months of this year. Some of these diseases were less prevalent this year than usual and still although the epidemic of poliomyelitis was the largest on record and practically all cases were reported, the number was less than that from measles, pulmonary tuberculosis and diphtheria. But it is said this disease not only kills large numbers, but it cripples many of those who survive. If by crippling is meant not only the loss of function of a limb but also the loss of sight or hearing, the loss of ability to enjoy life and to earn a livelihood, then the crippling from the other communicable diseases is fully as great. There are thousands of blind and deaf children in our asylums, but their defects are less obvious largely because the children are not so frequently exposed to public view.

Before discussing the communicability of poliomyelitis it may be well to review very briefly what is at present known regarding the infectious material and its spread, for contrary to what has been frequently stated our knowledge is greater than that which we have of many of the other communicable diseases. The virus is a very minute filterable microorganism, which is found in the spinal cord and brain, in the mucous membrane of the nose and throat, and in the intestines of persons affected with the disease; but is not found in the blood or in the other viscera. It is also found in the mucous membrane of the nose and throat of a certain percentage of healthy persons who have been in contact with patients. These act

as "carriers." It enters the body of the infected individual usually through the mucous membrane of the nose and throat, and this transmission takes place chiefly in the acts of sneezing, coughing and kissing. The virus resists moderate changes of temperature and certain chemical agents, but is destroyed by exposure to sunlight.

The evidence in favor of "contact" infection is conclusive. Wickman's investigations which were made under unusually favorable conditions proved it, and since that time new evidence has been added. In a paper recently published Richardson contends that poliomyelitis is chiefly transmitted by rats and other rodents or by insects on such animals, or by both in combination, rather than by personal human contact. One reason which he gives in support of his theory is that the virus of poliomyelitis resembles rabies, which is an animal disease, and does not resemble that of diseases like tuberculosis, influenza, pneumonia, diphtheria and septic sore throat all of which are known to be spread through personal contact. In answer to this it is only necessary to say that measles is certainly conveyed by personal contact, but its virus is filterable and certainly unlike that of tuberculosis, pneumonia, influenza and diphtheria; for if it was caused by such a microorganism it would have been long since discovered. I do not think that we have any right to conclude that all diseases which are spread by contact with infected human beings are necessarily caused by one type of microorganism, and that all those which are spread through the agency of animals and insects are caused by another type. Malaria, yellow fever, bubonic plague, and typhus fever are all spread largely by animals and insects, but the character of the virus is different in each and also different from that of rabies. Shep-

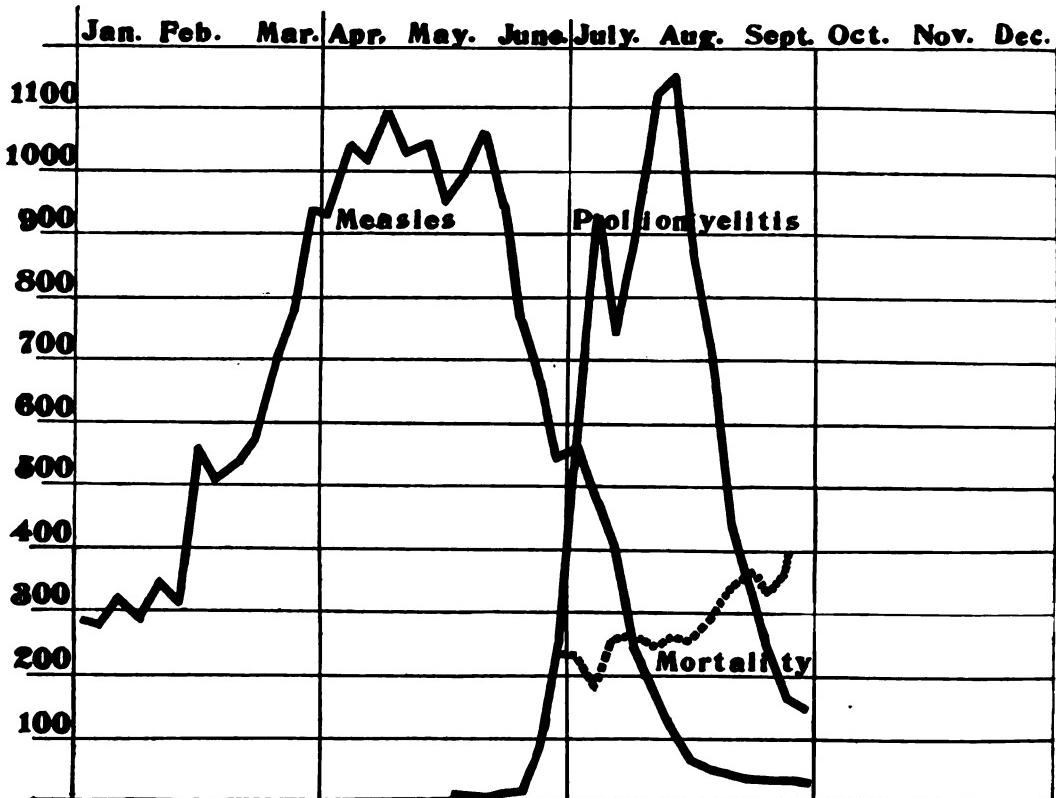
pard says "Emphasis has been given the Brues-Sheppard hypothesis which provides that it is impossible upon a priori grounds to rule out Stomoxys Calcetrans, (the biting stable fly) as a carrier of acute poliomyelitis, and a final decision must await the result of experiments." He then gives a number of charts which prove conclusively that the infection was spread by contact with patients and carriers and concludes "We submit that the evidence is all in favor of acute poliomyelitis being a contact infection and would warrant our urging that it be handled by the health authorities as such." As Flexner states "the experiments with the biting flies, bed bugs, mosquitoes, lice, have been negative on monkeys, and the earlier experiments with the stable fly have not been confirmed by recent experiments." Although most of the epidemics have occurred during the warmer months, when biting insects were numerous, an epidemic occurred in Sweden during the winter months also. There is no definite evidence to show that water, milk or food stuffs act as a means of conveying the disease. In this epidemic and in that of 1907-1908 I saw a number of cases of poliomyelitis in infants who were exclusively breast fed. In one institution in this city which cares for several hundred children, two cases of the disease occurred, and no more, although the water, milk and food were supplied to all the children from the same source. I believe it is a sound principle that the regulations for the prevention of the spread of a communicable disease should be based on our knowledge of the manner in which the infectious material is conveyed in the *vast majority* not in the *exceptional* case. If we know that poliomyelitis is in the vast majority of cases transmitted by contact, why should we go out of our way and assume

a number of other possibilities for which there is as yet no definite evidence. But it is said why cannot such contact be traced more frequently? Let us again compare it with measles. Of all diseases measles is most definitely conveyed by contact and still in a very large percentage of primary cases the most careful questioning of the mother will fail to reveal the time of contact. Why? Because it occurred at a time when the first patient was not known to have the disease. In poliomyelitis the conditions are similar only the unrecognized carrier takes the place of the unrecognized case of measles in the period of invasion before the eruption has appeared. Or again in tuberculous meningitis, we know that congenital tuberculosis is extremely rare, that in this disease the infection is with the bacillus of the human type and from a case of pulmonary tuberculosis, and still in only a small percentage of cases can the source of infection be definitely traced. We do not on that account conclude that such contact has not taken place or that some other method of infection must be sought. If we assume as seems highly probable that in poliomyelitis there are a very large number of carriers, that a *large percentage* of the *population* may act as such, we have a simple and plausible explanation of rapid spread of the disease. The conditions are not unlike those in an epidemic of pneumonia. Here it well known that a very large percentage of the population harbor the diplococcus, only a small percentage contract the disease, but all may convey it to others.

In chart 2 are represented the curves of measles and poliomyelitis for the first nine months of this year. Measles was less prevalent this year than last, so that the rise and fall of the curve is less abrupt than

usual. The curve of poliomyelitis shows a similar rapid rise and fall. This can only occur either with a disease which is very communicable, which as a disease poliomyelitis is not, or with a disease in which the rapid spread is due to a large number of carriers, so that the infectious material is quickly disseminated. A lay writer in the *Saturday Evening Post* (Sept. 2, 1916) puts it very well as follows, "These epidemics

been attacked, the virus infects less susceptible individuals, and loses something of its virulence in its passage through them, so that with diminished virulence of the infectious material and a small number of susceptibles, the epidemic dies out. To some it seems surprising that a "contact" disease does not spread by continuity, the circle enlarging like the circles on the surface of a pond into which a stone is thrown, but as



run a rather rapid course in any given community like fire in shavings or straw, which expires by virtue of burning up all its fuel. It is evidently a disease that is very actively infectious, but it is a fire for which few people are fuel." That is, the infectious material not the disease is very communicable. It is not unlikely that as the epidemic advances and the most susceptible individuals have

Wickman says "In densely populated districts with busy traffic an epidemic passes not as a running stream which must always flow through one region before it can reach the next, but by leaps, and we must expect such leaps."

Contrary to the prevailing idea among the public, poliomyelitis is but slightly communicable as a disease, much less so than

most of the common communicable diseases. From statistics compiled from observations of my own, I have found that of children intimately exposed and not protected by a previous attack, 96 percent. are infected with measles, 90 percent. with whooping cough, 25 percent. with scarlet fever. According to Frost of 2,070 persons exposed to poliomyelitis infection, only 14 or 0.6 percent. contracted the disease. This is not only much less than in the diseases above mentioned, but less than in influenza, pneumonia, typhoid, and cerebro-spinal meningitis. During previous epidemics this slight degree of communicability was recognized, and no strict isolation was enforced. Now poliomyelitis is looked upon by the public as in the same group with small-pox and bubonic plague. Even physicians have become infected with these views, so that many of those who in the epidemic of 1907-1908 were not at all alarmed, during this epidemic have refused to examine or treat such cases, not only because their other patients would no longer consult them, but because they feared that they might convey it to their own children. These same physicians would have no hesitation in treating cases of scarlet fever, diphtheria, whooping cough, pneumonia, typhoid fever or tuberculosis. It is well known that during previous epidemics the poliomyelitis patients were not isolated in our hospitals and still the infection of other children, nurses, or physicians was practically unknown. At the present time if a secondary case occurs it is reported as something alarming. In diphtheria, scarlet fever, whooping cough, and typhoid fever it is a commonplace.

Flexner says "where homes are not suited to the care of the ill so that other children in the same or adjacent families are ex-

posed, the parents should consent to removal to a hospital in the interest of the sick child itself, as well as in the interest of other children.....It is obvious that in certain homes isolation can be carried out as effectively as in hospitals." There can be no doubt that such isolation is valuable primarily because it tends to diminish the creation of a large number of carriers. However it is no more necessary to remove the majority of cases of poliomyelitis than the majority of cases of scarlet fever, diphtheria, pneumonia or typhoid fever. Even in the homes of people in moderate circumstances proper isolation and treatment is possible. It is not likely that anyone will accuse me of a lack of appreciation of the value of hospital treatment, but I can say without hesitation that a large number of the children would have received better care at home, than they receive in *some* hospitals. Even under the most favorable conditions one nurse has charge of a number of patients, and during an epidemic with over-crowding of the wards it frequently happens that one nurse has charge of 15, in one instance 17 patients. Occasionally it is necessary to place two children in one bed. When large numbers are admitted within a comparatively short time, observation for two weeks before admission to a general ward is wellnigh impossible, so that cross infections frequently occur. In the home even if the attendant is not so well trained, even if the mother herself does most of the nursing, it is still one nurse to one child. During this epidemic the hospitals have set aside a separate ward for their cases of poliomyelitis. It will not be easy to devote a separate ward to these patients when the disease becomes sporadic and only one or two are admitted occasionally. If we were consistent we should have a separate ward

for each of the communicable diseases, typhoid fever, pneumonia, tuberculosis, influenza and cerebro-spinal meningitis. As desirable as this might be it would add very greatly to the expense of conducting a hospital. Dochez has recently shown that "the pneumococcus found in patients with lobar pneumonia is not of the same type as that found in normal mouths. The two types of pneumococci responsible for the majority of the severe cases of lobar pneumonia were not found in the normal healthy mouth, except in instances where the patient harboring the organism had been in intimate association with lobar pneumonia. When such a condition existed the organism found invariably corresponded in type to that found in the lung of the patient. These studies made it probable that the majority of the cases of pneumonia depended either on direct or indirect contact with a previous case." We have had recently in the hospital a number of instances of such contact infection, either more than one member of the family, or two children living in the same house who were playmates, contracted lobar pneumonia within a few days of each other. Here then we have a distinctly communicable disease which during the present year was more prevalent than poliomyelitis, which caused twice as many deaths (lobar pneumonia 4,621, poliomyelitis 2,286) but the patients were not strictly isolated, only a small proportion were sent to a hospital, and there they were not isolated in a separate ward; no restrictions were placed on contacts, there was no definite period of quarantine, and the patients were discharged without making cultures to show the absence of virulent pneumococci. Although at present it might be difficult to carry out *all* these procedures, if we wished to be consistent we ought to

carry out some of them. During the period in which our poliomyelitis patients were isolated in a separate ward, we had twenty cases of typhoid fever in children. In six instances two or more members of one family were affected and in one tenement from which a number of our patients came, four families were affected. Surely this is conclusive evidence of communicability, but our typhoid fever patients were not isolated in a separate ward, and none of the other children, nurses or physicians were infected. The experience of many years has shown that with good nursing the danger of cross infection is not great. It has been frequently stated in the daily press that poliomyelitis cannot be properly and scientifically treated in the home. This is not true. I know of no procedure that cannot be carried out. If the attending physician is not himself familiar with the methods, there are many others who are. I have personal knowledge of a number of persons who could well afford to pay, who received for their children free consultations and treatment in hospitals. There is no more reason why this should occur in poliomyelitis than in any other communicable disease. In some instances the parents were forced to accept hospital treatment gratis. The following occurred in my own practice. In a case of poliomyelitis which I saw in consultation with Dr. F. the parents were in good circumstances and were willing to properly isolate and nurse the child. The Department of Health was also satisfied that isolation could be carried out, but the other tenants made such strenuous objections that the parents were forced to consent to removal. They were willing to have the patient in a private room with private nursing, but they were unable to obtain such a room in several hospitals to which they ap-

plied, it being near the end of the epidemic the institutions did not wish to continue their poliomyelitis service, and in one of the hospitals the Superintendent did not wish to admit such a patient to a private room because the other patients would object. Of course the chief difficulty is that such an absurd idea with regard to the danger has been created in the public mind. The child was transferred to a public hospital, where I believe there are no arrangements for the treatment of private patients. I am sure that the Health Department has no intention of sending people who can afford to pay private physicians to the dispensaries. Of course none of those who are well-to-do would think of going, but there is a large middle class to which the following notice of the Department may be ambiguous, "You are strongly advised to consult your family physician if he is skilled in the care of deformities; or visit the nearest one of the orthopedic dispensaries in the city given on the enclosed list." Only a very small percent. of physicians are skilled in orthopedic surgery and the patients are seen in the early stage chiefly by general practitioners and pediatricians, but if they are not qualified to give the after treatment they can easily refer the patients to those that are. As to fees, many of the younger assistants attached to orthopedic hospitals would gladly treat such patients as are in moderate circumstances at moderate fees. I do not think that the people should get the impression that diseases can only be treated scientifically and successfully in hospitals and dispensaries.

It is true that the welfare of the community is paramount to the privileges or even the rights of the individual, but it should be certain that procedures which interfere with such rights and privileges are

really necessary and beneficial to the community. Some years ago the vestibules of tenements and apartment houses were placarded when there was a case of measles, scarlet fever or diphtheria in the house. Terminal disinfection was the rule. The abandoning of these two procedures was in recognition of the fact that in the vast majority of cases infection was due to contact with infected persons not things, with human beings and not with inanimate objects. This marked a step forward. The return to the placarding of the vestibule in poliomyelitis, also a "contact" disease, could only be justified on the assumption that the entrance, halls and stairways were dangerous. If such were the case the apartment occupied by the patient would be still more so, and terminal disinfection would be logical. As a matter of fact both placarding of vestibules and disinfection are unnecessary, human carriers are the chief source of danger. An application of a 1 percent. solution of menthol in oil to the nose and throat of patients and contacts would seem a rational prophylactic procedure and will not interfere with the protective action of the normal mucous membrane.

Flexner says "Probably the period at which the danger of communication is greatest is during the very early and acute stage of the disease. Judging from experiments on animals the virus tends not to persist in the body longer than four or five weeks except in those exceptional instances in which chronic carriage is developed. Hence cases of infantile paralysis which have been kept under supervision for a period of six weeks from the onset of symptoms may be regarded as practically free of danger." I recognize the desirability of being more than careful when the public is unduly alarmed, and unjust

criticism is plentiful. These are some of the disadvantages of too great publicity; but I see no good reason for prolonging the period of isolation to eight weeks. Chronic carriers occur in poliomyelitis as they do in many other communicable diseases, but our regulations are not based upon such exceptional cases. In looking over the histories it will be found that the secondary cases occur within two weeks. In previous years we frequently discharged patients with poliomyelitis after three or four weeks and never had any "return cases" from the same family. In diseases such as scarlet fever which are occasionally communicable for a long time "return cases" are not uncommon. Why could we not limit the longer period of isolation in poliomyelitis to such patients as have a persistent catarrhal condition of the nose and throat?

There can be no doubt that the campaign of publicity has been of value. Much more attention has been given to cleanliness and there has been much greater care in the prevention of all kinds of contact infection; but it is a question whether the lesson learned under the stress of fear and anxiety will be remembered when the danger is passed. One is forcibly reminded of Charles Lamb's delightful "Dissertation on Roast Pig," roast suckling may be a delicious dish, but burning down a cottage is a rather expensive method of preparing it. After the people have become panic-stricken, it is difficult to persuade them that the danger is really not so great. It is as if there was a cry of "Fire" in an audience and some one came upon the stage and said "Ladies and gentlemen it is true there is a fire, but if you will all kindly keep your seats we shall soon have it under control." The public certainly requires instruction in the manner in which the communicable dis-

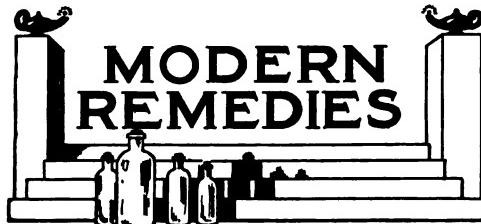
eases are spread, as witness the number of infants and young children that wore little bags of camphor or asafoetida around their neck, and the enormous quantity of disinfectants sold during this epidemic, but I believe that a campaign of publicity in which the names and addresses of patients and the number of new cases and deaths is given to the daily press, should be begun with the diseases in which we have a method of immunization, such as diphtheria, typhoid fever and smallpox. Large numbers of people would be induced to submit to immunization; the public would see that these diseases are really controlled and incidentally they would have greater confidence in the value of medical treatment.

There are two groups of communicable diseases which will never be really prevented and controlled except by means of a method of immunization: diseases which are communicable in the early stage before they are recognized, that is before the characteristic symptoms appear, such as measles and whooping cough; and those diseases in which carriers play a very important part, such as pneumonia and poliomyelitis. During the next few years the disease will probably appear in other parts of the country, and we shall have a larger number of sporadic cases chiefly because the disease will be more generally recognized. We shall probably not have another large epidemic in this city within the next ten years, because the greater part of the population has been immunized during the present epidemic. Time will be required for the accumulation of a large number of susceptible children, then a new and more virulent strain of the infectious material being injected the disease will spread. Even if a more potent serum is prepared the morbidity and mortality will not be markedly

reduced by its use therapeutically, but by a universal immunization of infants and young children against the disease as we now vaccinate against smallpox. It is not at all unlikely that such a method of immunization will be elaborated within the next few years.

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ing excessive doses, whereas a woman in labor was suffering pain and anticipated relief, so that the force of suggestion was added to the procedure. He had found that combined with small doses of pituitrin good results had been obtained. There is no arbitrary rule for chloroform dosage; it is necessary when the patient is unequal to the suffering. Very small amounts of chloroform will secure tranquillity and cooperation of the patient.



Conducted under the Editorial Direction of Dr. John W. Wainwright.

**Chloroform in Labor.**—I. J. Hill at the recent meeting of the American Medical Association, Section on Obstetrics and Gynecology, (reported in the *Medical Record*, July 8, 1916), delivered a paper on the use of chloroform in the first stages of labor in which he declared that the use of chloroform in obstetrics was formerly widespread, and accident was unknown, but that recently its use had been criticised largely on account of its relationship to active degeneration of the liver cells. Some hospitals had abandoned its use on this account. More evidence, however, should be forthcoming, based on autopsy findings, as to chloroform poisonings in obstetrical cases, than had at present been produced. Careful search of the literature failed to show sufficient evidence for abandoning it, as 5,000 chloroform anesthesias had been performed without death, and some of these in very protracted cases. The prejudice against chloroform seemed to have arisen largely on account of laboratory experiments on dogs, in which it was found that damage took place by liberation of hydrochloric acid with alkalies. On this account Dr. Hill had undertaken a series of experiments on animals under chloroform anesthesia. His conclusions were that these experiments were in no way comparable to human anesthetics, the animal being frightened and struggling for hours, and requir-

**Diagnostic Value of Gonococcus Vaccine.**—Asch and Adler (*Muench. Med. Wochenschrift*, March, 1916) advise the injection of a killed gonococcus vaccine of 25 to 125 million. This suffices to bring about a reappearance of the urethral discharge of latent gonococci. They insist that no case of gonorrhea should be declared cured unless this test has been made and proved negative.

**Urotropin as a Urate Solvent.**—Hanzlik, (*Journal of Laboratory and Clinical Medicine*, May, 1916), declares that a recent investigation on the action of hexamethylenamine, indicates that its power as a urate solvent is practically *nil*, at least in therapeutic doses. Even when given in excessive doses, its action is less than that of the old fashioned alkaline diuretics, which are inefficient enough.

**Magnesium Sulphate in Cellulitis.**—Paymaster, (*British Medical Journal*, Mar. 11, 1916), supports the views published by Tulloch on the treatment of septic wounds by magnesium sulphate. The treatment of erysipelas by this agent is mentioned in text-books on surgery published before the Listerian era of antiseptic surgery. It was then used empirically; now, as the results of Tulloch's researches, its action is known to be due not to the hypertonic effect on the tissues, but to its power of inhibiting the growth of streptococci and most of the granulated-negative forms of bacilli found in wounds. He suggests that the benefit of the treatment is very much hastened and more efficacious, while the change of dress-

ings is less frequently required if a saturated solution with 10 per cent of glycerine is employed.

lessness and fever, sweet spirit of nitre in sweetened water, alone or in combination with spirit minderer. Sponging with magnesium sulphate solution, one ounce to sixteen ounces of tepid water, will be found grateful and soothing.

**Ferrivine and Intramine in Syphilis.—**Harrison and Mills, (*The London Lancet*, June 17, 1916), report testing the action of these two agents in three cases of syphilis and to have found them to have entirely failed to cause the spirochetae to disappear from lesions in well marked secondary cases. After this failure to cause their absence from a mucous patch a single dose of salvarsan was successful in eighteen hours. Clinically the authors were unable to detect any influence of either or both of the compounds ferrivine or intramine on syphilitic lesions, although each was of a variety which heals in a week or ten days and under salvarsan treatment. Their investigators also disclosed that both ferrivine and intramine are extremely unpleasant in their effects; that neither has a specific effect on early syphilis.

**Emetine in Intestinal Hemorrhage.—**Allen, (*Prescriber*, May, 1916), has recently had the opportunity of noting the effects of emetine in treating soldiers recently returned from the front with dysenteric symptoms, accompanied by blood and mucus. The effect of a hypodermic injection of 1-3 grain of the hydrochloride salt once daily he considers wonderful; it brought about the speedy disappearance of the blood from the stools, while the dysenteric symptoms quickly disappeared. In a case of a soldier in training who developed a most troublesome mucous colitis, resisting the usual treatment, emetine hydrochloride in the above dose was successful in curing the condition.

**Serum Treatment of Typhus Fever.—**Nicolle and Blaizot, (*Presse Medicale*, April 13, 1916), report having found it possible to produce an immunity to typhus fever in horses and donkeys by repeated inoculations of an emulsion of the spleen or adrenals from guinea-pigs suffering from typhus infection. The serum first tried on animals, was found to possess distinct preventive as well as curative properties. It is non-toxic to man, and was used in nineteen cases of typhus fever with favorable results.

**Colloidal Gold in the Treatment of Pneumonia.—**Commes, (*Presse Medicale*, May 25, 1916); advises intravenous injections of colloidal gold, begun as soon as the diagnosis is made certain. One to two cc. may be injected without unfavorable results: three doses a day being usually sufficient to bring about a normal temperature and the arrest of the progress of the disease.

**Calcium Sulphide in Rubella, or German Measles.—**Edmund Gray (*New York Medical Journal*, July 15, 1916), declares that the one remedial agent which may be commended for service in this complaint is calcium sulphide; but that it must be an efficient preparation, well protected from atmospheric influence. The dose should be according to the patient's condition rather than age, and vary from one-sixth grain to two grains or more; and that the interval should be from one-half to three hours; the object being to render an unwholesome condition for the growth of the specific virus. For rest-

**Strychnine Not a Stimulant.—**Chase and Schlovomitz, (*Iowa State Medical Journal*, May, 1916), declare that strychnine unsupported by unquestioned, specific, selective stimulants in pathologic situations, merits condemnation, and that its supposed unaided supportive action might be positively dangerous.

**Iodine in Treatment of Typhus Carriers.—**Kalberlah, (*Med. Klinik*), employed tincture of iodine in five cases where the patients had recovered from typhus fever, the typhus bacillus still being present in the feces at the military hospital of Frankfurt-

a-Main. He gave the tincture, *Pharmacopei Germanica*, in doses of 7 to 15 drops in water three to five times a day, half hour after meals, together with one teaspoonful of Mercks animal charcoal made from blood also three to five times a day. One of the patients whose urine contained the bacilli also received in addition urotropine and salol.

The bacilli disappeared within eight days; in two, however, the bacilli returned which readily again disappeared upon resuming the treatment. Careful tests were made in two months but the offending organisms could not be distinguished.

This treatment was not used in old infections. No disagreeable effects were noted.

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**Santonine in Chronic Cystitis.**—Sinha, (*Indian Medical Record*) states that santonine acts very promptly in chronic cystitis, when given in one-half grain doses three times daily. The sensitiveness and feeling of fullness in the bladder disappear and a cure is generally effected in a very short time.

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**Alutan.**—Cloetta (*Correspondenz-Blatt für Schweizer Aerzte*, July 22, 1916) refers to alutan—colloidal hydroxide of aluminum—as a substitute for bismuth, which has increased in price. He declares that alutan passes through the stomach unchanged, but is slowly dissolved in the intestine, where it is not absorbed, but exerts an astringent action. The author recommends this agent on the theoretical grounds that it is correctly adapted to remedy diarrheal conditions.

Liebmann, in the same journal, reports several cases in which alutan produced excellent results. He regards it as a very useful remedy in diarrhea from various causes. The dose is from two to three tablespoonfuls daily in milk or water. The only unpleasant consequence noted was vomiting in two cases.

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**Venesection.**—Theilhaber (*Berliner klin. Wochenschrift*, January 10, 1916) declares that venesection as a therapeutic measure

is too little appreciated. He writes that it gives great relief in many and various conditions such as dysmenorrhea, intermenstrual colic, the symptoms of the menopause, neuralgia and neuroses in plethoric persons, and in some forms of nervous headache. There is, the author declares, another field in which venesection is valuable, and that is as a means of minimizing the recurrence of cancer after operations. Whether he thinks the original cancer has been wholly removed or not, the withdrawal of 400 to 500 cc. of blood twice a year will accomplish much in preventing recurrence or metastases. The mechanism is believed to be dependent upon the stimulation of the hematopoietic organs secondary to the removal of the blood. Combined with diathermy and glandular extracts, excellent results may be expected.

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**Homogenized Olive Oil Mixture.**—Fadd at a meeting of the American Pediatric Society, Washington May 9 to 11, 1916 presented a paper on the above subject which was reported in the *New York Medical Journal*, August 26, 1916. He described a method of substituting olive oil for cow's fat in milk modifications in order to avoid the fatty acids, which are regarded as the cause of indigestion in certain cases. By this method, he could obtain minute and permanent emulsions of the fats. In a series of thirty-seven cases, which had been unsuccessfully fed during an average of 6.3 months each, with a gain of only five ounces a month, successful results were obtained by the use of the Caulin homogenizing machine. When this same set of children were fed of these mixtures thus prepared, the rate of gain over a period of 4.7 months was increased 18.15 ounces a month, with a corresponding improvement in the general condition of the patients.

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**Sparteine.**—Zeigler (*Southern Medical Journal*, August 1, 1916) declares sparteine is not a cardiac stimulant. It is a depressant to both the heart and respiration. Death, he declares is due to failure of respiration, aided by the action of the drug upon the heart muscle.

**Total Ovarian Substance or Corpus Luteum?**—For a number of years there has been a "run" in current medical literature on the importance of preparations of the corpus luteum in organotherapy as compared with the total ovarian substance in similar indications. At that time opinion seems to have been very firmly in favor of the corpus luteum of pregnancy as the only really therapeutically active portion of the gland. There has been a good deal of discussion about this, and only recently have several weighty opinions been advanced in favor of the desiccated total gland instead of the Graafian follicles without any of the stroma admixed with them.

Blair Bell in his recent book "The Sex Complex," remarks that there is no reason for using the more expensive and less easily obtained corpus luteum instead of the total ovarian substance, claiming he gets better results from the total gland. Now comes Dr. W. P. Graves of Boston who, in a consideration on the practical aspects of the internal ovarian secretions, says (*New York State Journal of Medicine*, August, 1916) he has found extract of the whole ovary more efficacious in the treatment of functional amenorrhea than extract of the corpus luteum. In the discussion which followed this paper, Bandler agreed that the extract of the whole ovarian tissue was more efficacious than that of corpus luteum alone, and he does not now use corpus luteum extract. Graves also remarks that "luteum extracts are prone to disturb digestion, while ovarian extract is seldom toxic." Rabinovitz (*American Journal of Obstetrics*, February, 1916) differentiates the physiological function as well as the therapeutic indications of the follicular and luteal substance from the ovaries and suggests that cases due to hypoovarism, including amenorrhea, sterility, infantilism, certain forms

of dysmenorrhea, and also metabolic dyscrasias in which ovarian insufficiency is present, may be successfully treated with the follicular extract (or the whole gland). On the other hand, this writer includes two quite dissimilar conditions as those best treated with corpus luteum, viz.: (1) cases of hyperovarism including functional menorrhagia or metorrhagia, increased sexual appetite and osteomalacia; and (2) cases with what Rabinovitz calls "hypoluteism" or those with emesis gravidarum and other forms of toxemia of pregnancy, eclampsia, etc.

There is no doubt that there is an active principle in corpus luteum; but it seems that in many instances as good or better results follow the use of the considerably cheaper total ovarian substance; and we pass on this information for the encouragement of several who have expressed dismay at the increasing price of corpus luteum preparations.

**Thyroid Therapy for Tendinous Contractures.**—Some years ago a good deal of interest was aroused in medical circles in Paris by a report before one of the scientific societies by Leopold Levi that he had successfully treated a severe case of contraction of the palmar fascia by the oral administration of thyroid for some weeks. There was then, and always has been, a good deal of speculation as to how the softening of the hardened and tense tendons could be brought about in this way. A few months later other references to this same thing appeared in the literature, and there evidently must be a basis for the application of thyroid therapy in the treatment of contractures.

Quite recently (*Semana Medica*, No. 16, 1916) Pizarro reports the successful treat-

ment of a post-rheumatic contracture which had rendered both hands quite useless. The patient, a girl of fifteen, previously had had three severe attacks of acute articular rheumatism and the contracture came on following the last of these. None of the usual measures, local or general, causing any benefit, they were stopped and a course of thyroid medication was started. Benefit was obvious as early as the sixth day, and at the end of three weeks the normal condition had been completely restored.

This is not one of the common indications in thyroid therapy, for Dupuytren's and other tendinous contractures are not common; but it is another evidence of the wide range and utility of this now quite usual therapeutic weapon, and there should be no reason why this connective-tissue-softening effect should not be used in the treatment of other contractures, especially those following wounds.

**Thromboplastin Becoming Better Appreciated.**—In a news item in a recent issue of the *Journal A. M. A.* it is stated that large quantities of thromboplastin are being sent to the Mexican border for use in checking hemorrhage; and while the literature on the use of this remedy is not increasing, there is no doubt that its use is gaining in favor. In the *California State Journal of Medicine* (August, 1916) this preparation is called "brain soup" and we learn that it is easily made by macerating the brains of calves in salt solution, straining and adding a small percentage of trikresol to preserve it. It is there recommended for a number of conditions other than following tonsillectomy (the original recommendation of Hess, Cronin and others) and its prospective value is mentioned in cancer with oozing, following the removal of varicose veins, hemorrhoids, and in war service.

**Pituitary Extract in the Treatment of Diabetes Insipidus.**—Hoppe-Seyler (*Munch. Med. Wochenschrift*, November 30, 1915) discusses the treatment of diabetes insipidus with pituitary. One case was thus treated and that successfully. The

author also reviews some of the literature, and expresses the belief that this complaint is not due to any one special lesion, but rather to a vasomotor upset from different causes. He also believes that the kidney is not at fault. The patient treated by the author was a male, 25 years of age, suffering from a rather marked degree of this condition. Notable improvement was evident from pituitary and this applied not only to a marked decrease in the quantity of urine, but to a return to a concentration nearly normal. No results were noted when the extract was taken by the mouth; it was necessary to give it subcutaneously. Tests for tuberculosis and syphilis were negative.

**Cerebrin in the Treatment of Cerebral Neurasthenia.**—di Figuera (*Revista de Medicina y Cirugia Practicas*, July 8, 1916) reports having used cerebrin or cerebral extract in six cases, finding that when freshly prepared it exerts a beneficial action on the headache, vertigo, insomnia and nervous agitation of cerebral neurasthenics. It may be given by mouth, but is better by hypodermic injection which should be continued for several months.

**Growing Importance of the Endocrine Glands in the Study of Disturbances of Metabolism.**—The study of the normal and pathological physiology of the endocrine glands is at the present time assuming vast importance in the realm of medicine. And, continues Joughin (*New York Med. Journal*, Oct. 7), "the very obvious relation of these glands to metabolic disturbances and the profound influence which they undoubtedly exert over the entire human economy, is continuously becoming more and more impressed upon us. The clinical expressions translating their disordered function are slowly evolving, so that through the mist of uncertainty which today envelops us vague forms may be distinguished, which at some future time we hope to see materialize to reveal to us diagnostic and therapeutic possibilities of striking potency."

We are as yet far distant from this goal which we so ardently desire to reach, but

we are decidedly progressing toward it. The recognition of the fact that a uniglandular symptomatology does not exist, that a pluriglandular symptomatology, dominated if you will by the preponderating disorganization of one or more glands, always exists, is a great step in the right direction. The intricate and little understood relations existing between all these structures is now everywhere recognized, and the cautious physician will certainly not dogmatize too positively as to the landmarks in this *terra incognita*."

**Modern Psychology and a Practical Philosophy of Life.**—The part which motives play in ordinary living has not been sufficiently recognized. The various new theories for the treatment of functional nervous disorders give rise to numerous interpretations as to their etiology. Dr. Putnam in his book *Human Motives*, (Little, Brown & Co.), has made an effort to indicate the aid which modern psychology affords in the establishment of a sound and practical philosophy of life as the basis of rational and healthful living. He differentiates the psycho-analytic approach which deals with the concrete experience of individuals from the philosophic or rational mode of approach which is based upon the observation that "no logically minded person finds it possible to think any particular thought without realizing on reflection that this implies entertaining other thoughts without which the first would be incomplete."

While he aims to establish reasons for adducing religious standards of motives as the one indicating the main goal of progress, there are many of the reasons which he adduces which will not be generally accepted, though his argument makes a strong appeal to those who have religious leanings. His conception of the subject is excellently defined and logically formulated.

The opposition to the psycho-analytic movement he attributes in a sense to the resistance in people's minds which he regards as indicating "one of the strongest reasons for believing that we have here to deal with a set of feelings that are in the first place extensively strong, in the next place vigorously repressed and in the third place preserved through this very repression as furnishing a real and desirable richness of meaning to all the acts of daily life in which personal relationships are concerned, and also as furnishing a treasure-house of excitement on which we can instinctively draw, even to an undesirable extent, without making it appear even to ourselves, that this is being done."

The regrettable obstacle which he acknowledges is that the psycho-analytic method in its complete form is applicable only as between doctor and patient. Parents or teachers are impossible in this direction without special training. They are limited to recognize the means of the method and to mastering "a few of the principles which its use has emphasized and to consider in what way these principles can be applied to children at large in the schoolroom and at home."

One may pause to wonder whether there is hopefulness in the thought that "the choice of motives, whether voluntarily or instinctively made, must depend in the final analysis on the standards arrived at through education, the true function of which consists in leading to the discovery of deeper and deeper relationships between the outside world and the inner life."

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**Hay fever.**—From the table of contents to the index there is an interesting discussion of hay fever by Hollopeter in his recent treatise on *Hay Fever, Its Prevention and Cure* (Funk & Wagnalls Company). Very nearly 40 pages are devoted to articles which have been printed in medical journals and which do not represent the fullest discussion of either the treatment or the prevention of the disease.

The preface refers to "remarkable and uniform success with a simple treatment of hay fever for the last twenty years." In summarizing his treatment, he stresses the importance of removing "the stigma of neu-

rotic inheritance and anatomical defects in youth and by observing the rules of the Hay-Fever Prevention Association, as outlined by Dr. Scheppgrell and quoted in this book. The careful study of pollen by Dunbar has advanced the possibility of cure by this means and will eventually bring about a more scientific adjustment of the remedy. At the present time, however, treatment has not been satisfactory." And this represents the achievement of the book, despite the fact that the preface states that the author's most original communication is devoted to the all-important point in the discussion—the successful treatment.

The bibliography, which is appended may atone for some of the other shortcomings of the book.

**The Treatment of Poliomyelitis.**—The accumulation of facts concerning infantile paralysis are rapidly being given to the public through special and general literature. It is unusual to have a medical book frankly state in its preface that certain chapters are written so that "the parents of a case may read what is needed for a child and why." On the other hand volumes should not be judged entirely on the basis of information being given to the laity. Some books aim to assemble the literature of the subject, while others are records of personal experience. *A Manual of Infantile Paralysis with Modern Methods of Treatment; Including Reports Based on the Treatment of Three Thousand Cases,* (Frauenthal and Manning, F. A. Davis Company) belongs to the category of the books written from personal experience.

Why the authors should claim that the manual is as free from technical terms as is possible is beyond understanding, considering that physicians should be able to read ordinary technical literature. That promise and performance do not coalesce is indicated by the "non-technical" language evidenced in the following paragraph.

"From the foregoing it may be deduced that the etiologic factor of acute poliomyelitis is a pleomorphic, motile, anaerobic, pathogenic, obligative hemoprotzooon; with a developmental cycle consisting of a resisting, motile, dividing, and resistant spore stage; which elaborates a virus having a destructive affinity for myelin and susceptible

to great augmentation and modification; capable of pure culture in an anaerobic preparation of a solid or fluid, sterile, living body tissue; reacting specifically to the azurite-carbonate dye; bearing a strong clinical and histologic analogy to rabies; pathogenic to man and domestic to animals; endemic in the tropics; epidemic in the tropics and in the temperate zone during the summer season; pandemic under conditions of prolonged heat and drouth and other unknown factors most favorable for its wide diffusion."

The authors apparently favor the idea of the distribution of the disease by some blood-sucking insect and as a result the amount of space given to this phase of the subject is probably larger than is warranted at the present time for practical purposes.

Naturally, portions of the book devoted to the pre-paralytic stage are not thoroughly up to date in view of the experiments of the past summer with adrenalin, serum therapy, and similar therapeutic agents. The most valuable parts of the book consist of the chapters devoted to the various forms of physical therapy and the voluntary exercises performed before a mirror.

For those who regard infantile paralysis as an occasional epidemic much illumination is to come from a glance at a table of epidemics and pandemics compiled by Dr. Manning dating back to 1841. There are comparatively few years since 1893 when there has not been some epidemic of this disease.

Taken as a whole, the discussion on etiology is sufficiently extensive and except for the unequal distribution of space to the various theories, it is eminently satisfactory. As a record of personal experience, a manual of this type has many advantages over a book which is acknowledged to be a simple compilation of the experience of others. Hence, regardless of larger volumes, this one merits attention.

**Plague and the Destruction of Rats.**—With the essentially chaotic state of shipping and oceanic travel that will persist for sometime after the war, it is reasonable to anticipate more or less laxity in health regulations. The great scourges to which the old world countries are often subject are

certain to be fanned into flame by the conditions that will exist, and in spite of the utmost vigilance of our American quarantine officials, occasional cases of the pestiferous diseases are bound to reach our seaboard cities. The practitioner, therefore, in New York City or San Francisco or the other ports of entry on both our Atlantic and Pacific coasts may be brought face to face any day with a case of yellow fever, typhus, or plague. On his ability to recognize the disease instantly may rest the lives of hundreds. It behooves every physician, therefore, to familiarize himself with these diseases, rare though they are to this country at the moment.

As an aid in this direction we wish to pay a very deserved tribute to Dr. Thomas W. Jackson's recent work on *The Plague* (published by J. B. Lippincott Co.). This is unquestionably one of the most valuable contributions to the subject that has appeared since the plague, its etiology and transmission in particular, became better understood. Dr. Jackson's qualifications enable him to handle his subject not only with authority, but with a familiarity with its practical phases that makes the whole book exceptionally interesting. The following excerpt on rat-proofing will confirm the foregoing:—

"Municipal authorities should take up the matter of rat-proof construction for new buildings and the rat-proofing of old ones by approved alterations. In Manila, Hong Kong and elsewhere these methods are receiving attention and encouraging reports are recorded, more particularly with regard to the disappearance of plague in districts so treated than in the disappearance of rats. This is most important, for if the rat and his fleas are excluded from houses and therefore from intimate association with man (an apparently feasible matter through the rat-proof construction of buildings), protection against human plague is in great measure accomplished.

In Manila the disappearance and continued absence of human plague in previously infected localities goes hand in hand with the introduction of systematic rat-proofing in sections where cases of human plague occur.

These measures were first instituted in 1906 and plague disappeared from Manila in the same year and did not reappear until 1912.

From 1900 to 1905, \$15,000 was paid in rat bounties and \$325,000 was paid for salaries, wages, and expenses in rat catching, with little appreciable effect upon the number of rats and without causing the plague to entirely disappear. It must be admitted, however, that practical

control of the disease was attained during this period.

Rat-proofing of dwelling houses is less expensive than perpetual wholesale rat destruction and is a perfectly effective measure against human plague. In the suppression of the San Francisco epidemic in 1907 rat-proofing was also extensively resorted to.

The expense of rat-proofing has been generally considered as prohibitive, but if the work be confined at first to the vicinity of infected centres and if it be carried on subsequent to rat-destruction in corresponding areas the expense need not always be prohibitive—at least in American governed cities. The Manila plan of plotting the city into 'plague-infected' areas corresponding with the capture of plague-diseased rats and systematically working within geographic boundaries in which rat plague exists or is likely to spread, as determined by rat captures and examinations of the rats for signs of plague, has proved to be a good plan."

The whole work is to be commended as an up-to-date and comprehensive exposition of the subject.

#### BOOKS RECEIVED.

**Diseases of Occupation and Vocational Hygiene.**—Edited by George M. Kober, M. D., LL. D., of Washington, D. C., and William C. Hanson, M. D., Belmont, Mass., with illustrations and reference tables. Philadelphia. P. Blakiston's Son & Co., 1012 Walnut St. Price \$8.00 net.

**The Practice of Obstetrics.**—Designed for the Use of Students and Practitioners of Medicine. By J. Clifton Edgar, fifth edition, revised twenty-second thousand, with 1316 illustrations, including five colored plates and 34 figures printed in colors. P. Blakiston's Son & Co., Philadelphia. Price \$6.00 net.

**The Expectant Mother and Her Child.**—By Margaret J. Modeland, R. N., with an introduction by Harold A. Miller, M. D., illustrated with photographs and diagrams. The John C. Winston Co. Price \$1.00 net.

**A Lecture Entitled the Christian Science Church.**—By William McAfee Goodwin, L. B. C. S., Christian Science Practitioner, Teacher and Lecturer, 303-307 District National Bank Building, 1406 G Street, Northwest, Washington, D. C. Price \$1.50 net.

**The American Year-Book of Anesthesia and Analgesia.**—F. H. McMechan, A. M., M. D., editor, 1915. Surgery Publishing Company, 92 William Street, New York City. Price \$4.00.

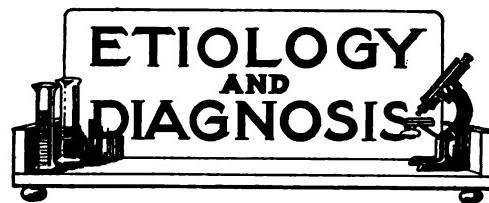
**The New Morality.**—An interpretation of present social and economic forces and tendencies. By Edward Isaacson. Published by

Moffat, Yard & Company, 1913. Price \$1.25 net.  
Postage 10c.

**International Clinics.**—Volume 111. Twenty-sixth Series, 1916. Published by J. B. Lippincott Company, Philadelphia.

**Diseases of Infancy and Childhood.**—By L. Emmett Holt, M. D., Sc. D., LL. D. and John Howland, A. M., M. D. Seventh Edition, fully revised with 215 illustrations. Published by D. Appleton & Company, New York.

**Preventive Medicine and Hygiene.**—By Milton J. Rosenau, M. D., Professor of Hygiene, Harvard University. Second Edition thoroughly revised. Published by D. Appleton & Co., New York.



**Early Diagnosis of Acute Infantile Paralysis.**—Ager in the *Archives of Diagnosis*, (July, 1916) discusses the symptoms other than paralysis upon which an early tentative diagnosis may be based. The premonitory symptoms indicating an acute general infection vary as widely as in scarlet fever. The impression that has arisen, that catarrhal symptoms are frequent, is erroneous, increased secretions from the mouth, nose, and eyes being practically never present except in the later stages of severe infection. The existence of a large class of cases in which there is definite evidence of invasion of the central nervous system without an appreciable resulting paralysis renders it necessary that a tentative diagnosis be regularly proved or disproved by careful examination of the spinal fluid. The early diagnostic symptoms are divided by Ager into those of the psychic, the motor, and the sensory tracts. Characteristic is a psychic inhibition varying from drowsiness to coma. The latter is distinguished from that of meningitis in that the patient can be aroused to almost normal mentality; the special senses respond readily. Some children, however, exhibit a marked excitability and suspicious watchfulness; in a few instances a state of delirium is reached. Among the early motor symptoms an anteroposterior cervical stiffness, usually with similar spinal rigidity, is frequent; a tendency to resist motion of any or all extremities may also be noted. Later, particularly in the meningitic type of case, there may be true—not reflex—spastic rigidity, scaphoid abdomen, and convulsions, as in other forms of meningitis. Occasionally increased knee jerk and ankle clonus are noted. The author has seen twitching of affected muscles before the advent

of any definite signs of paralysis. The sensory symptoms, in the present epidemic, seem to be present in nearly every case. Pain and hyperesthesia are frequent in the polyneuritic—or better, pseudoneuritic—type of the disease. The pain and tenderness along the nerve trunk is usually such as to necessitate free use of codeine or morphine. Nearly always the skin and muscles of the back are similarly affected early in the disease, this being soon followed by muscular pain and tenderness in the limbs, often leading to treatment for rheumatism by mistake. Special centres are frequently affected in addition. Marked sweating even with a high temperature, is a frequent early symptom. Low temperature of a limb occasionally occurs early in the disease. Circulatory disturbance may be indicated by a tache, irregular lividity or mottling, or pronounced localized flushing. To facilitate early diagnosis and permit helpful treatment, these symptoms as noted should be sought in all suspected cases.

**Hypothyroidism.**—Brown in a recent issue of *Northwest Medicine* gives the following objective symptoms as pointing to thyroid deficiency:

1. Obesity with pasty, anemic appearance, especially in children and in young adults.
2. A dry skin and scanty perspiration even on exertion. The skin is hard, board-like, and does not pit on pressure.
3. Brittle hair and fingernails. The hair is scanty. The hair of the outer third of the eyebrow is often absent.
4. The heart action is, as a rule, slow and blood pressure is sometimes quite low. A high blood pressure is, however, not uncommon in cases of long standing.
5. Albuminuria and scanty urine with high specific gravity but low urea content is quite common.
6. Scanty, irregular, and suppressed or painful menstruation is a very common disorder, due to poor functioning of thyroid gland. The opposite menorrhagia, is also common in obese young women.
7. Subjectively the symptoms are quite as varied. Enuresis nocturna in children is often due to hypothyroidism.
8. Muscular weakness, inability to sustain long and severe mental or physical effort, and sensitiveness to temperature changes are quite marked. Headaches, neuralgias, and especially the variety known as sick headaches, are almost characteristic of this disorder. Psychical disturbances are not uncommon.
9. Backwardness in children, especially of walking and talking.
10. Enlarged tonsils and adenoids are not infrequently associated with hyperthyroidism.
11. Skin eruptions of the eczema type are not uncommon and are exceedingly stubborn, unless the true cause is recognized.
12. The facial expression should be noted. The complexion is often of a pinkish-yellow hue, which Hertoghe considers of great value in making a diagnosis.

**Cholecystitis; Changes Produced by the Removal of Gall Bladder.**—Judd in the *Med. Record* (June 24, 1916) discusses the function of the gall bladder and the effects of its removal, and gives the technique of cholecystectomy, which he considers the gall-bladder operation of choice. The conclusions the author draws are as follows: The systemic circulation is probably the most important avenue through which infection reaches the gall bladder. We are not yet able to recognize all cases of cholecystitis even with the abdomen open. The clinical history is most important in determining the existence of cholecystitis. Chronic cholecystitis without stones does exist as a definite pathological lesion and produces symptoms that will be relieved by the removal of the gall bladder. The only change in surrounding structure produced by removal is the dilatation of the common and hepatic ducts and possibly the stump of the cystic duct. This dilatation is most marked in the hepatic duct. Eventually this dilatation with increased pressure, overcomes the action of the sphincter at the intestinal end of the duct, and the bile passes through the duodenum with very little resistance. The author believes that this mechanism explains why the removal of the gall bladder cures symptoms produced by inflammation of the pancreas is caused by bile from the common duct entering the pancreatic ducts. Finally, the changes in the ducts which follow cholecystectomy indicate that the gall bladder has a definite function.

**Acute Septic Parametritis.**—In his exceedingly practical and valuable paper Walscheid (*New York Med. Jour.*, Sept. 16, 1916) says that acute septic parametritis begins with pain, high temperature, and chilliness or chill. It may occur early or late, even after the patient is doing her housework. Incubation in any disturbed pregnancy arises through an erosion, injury, or normal puerperal involution. Pain is the prominent symptom; although it may be slight, it is always present, and every pain in the lower abdominal quadrant, especially to the side, should be considered seriously. If an exudate is not felt and only slight abdominal and vaginal tenderness with low temperature is found, we must be on our guard. An exudate may exist and not be palpable, but tenderness is always present in the early stages and is situated at the lateral edge of the uterus. We seldom find it at the pelvic wall. It is unilateral in the early stages, but twenty-four hours may mark its rapid progress over to the side. Deep respiration, jars, coughing, or the slightest movement causes pain, and respiration is usually increased. Continued pain, high temperature, and tenderness, with a palpable exudate at the end of twenty-four hours, indicate the extension of infection. Virulence controls rapidity and the entire local picture.

Severe conditions, however, may not show any constitutional effects, whereas mild exudates may create profound septic exhaustion. Vomiting

indicates peritonitis; lochial odor means nothing when the infection has reached the broad ligament. Temperature ranges from 100° to 101° F. with septic remission, the pulse balancing from 100 to 120. Sudden rise of temperature, 103° to 104° F., and pulse with increase of pain means extension of exudate or pus formation. We should make frequent vaginal examinations. The harder the exudate, the better the immediate prognosis. The temperature is also safely diagnostic, as it becomes fixed in four to seven days. Reducing slowly to normal means resolution; rising higher, purulent solution. A temperature suddenly falling means rupture, especially if it rises again. In this way, the temperature may rise and fall for some time, depending upon free or obstructed drainage. Pus formation usually occurs in the first two weeks.

In parauterine parametritis, we always measure the quantity of urine passed in twenty-four hours. A patient may acquire uremia from kidney stasis due to ureteral distortion, constriction, or occlusion.

**Alcohol as an Etiological Factor in Arteriosclerosis and Associated Cardiovascular Disturbances.**—Theodore C. Janeway in his Shattuck lecture, delivered before the Massachusetts Medical Society, June 6, 1916, (published in the *Boston Medical and Surgical Journal*, June 29, 1916), on the Etiology of the Diseases of the Circulatory System has the following to say concerning the role played by alcohol as an etiological factor in arteriosclerosis and associated cardiovascular disturbances: Alcohol is frequently assumed to be one of the important causes of arteriosclerosis and its associated cardiovascular disturbances. Allbutt reviewing the evidence, including the negative findings of Richard Cabot, concludes that alcohol is not a "cause in eminent domain," but acts as the ally of other poisons. Faber believes it exerts a deleterious influence on the vessels directly as well as indirectly. A study of my own private cases showing hypertension lends no support to the view that alcohol has an important influence in the production of this type of arterial disease. Of 397 patients whose histories as to alcohol were known, 37.5 per cent. were total abstainers; 31.5 per cent. took alcohol only occasionally in small amount; 18.1 per cent. were habitual temperate drinkers, that is, never using more than three drinks a day. Those who regularly or occasionally used alcohol in excess in amounts were but 12.9 per cent. of the total.

**The Diagnosis of Vesical Hernia.**—The diagnosis of vesical hernia is often made very obscure and while sometimes made before operation, it is more usually made during or after the operation, according to Cameron and Higgs in St. Bartholomew's Reports.

**Before Operation.**—In cases of large scrotal hernia in males, chiefly old men, there may be an obvious connection between the hernia and micturition. (a) The swelling may increase in

size as the bladder fills, and diminish after the act of micturition; (b) pressure on the tumor may cause an urgent desire to micturate; or (c) micturition may be impossible, unless the scrotum be raised by the hand. In such cases there is no difficulty in diagnosis. But in many cases there is no evidence of the condition, and discovery during the operation is all that can be hoped for.

*During Operation.*—Diagnosis depends on the type of vesical hernia. If the portion of bladder involved is in the peritoneal sac with other contents, no difficulty, as a rule, arises, as it will be pushed back into the abdomen with the rest of the contents, and the sac ligatured and removed. When the bladder is present, in addition to an ordinary hernial sac, it is usually recognized without difficulty. The presence of two sacs in the inguinal or femoral canal makes it almost certain that the posterior and internal protrusion is the bladder. It may appear to be merely a mass of extra-peritoneal fat, and its position may alone arouse suspicion.

Diagnosis is most difficult when there is no peritoneal investment to the hernia; and what appears to be the hernial sac is the bladder wall. It is almost impossible to recognize this condition before operation. Even when all overlying structures have been divided, the bladder wall exactly resembles in appearance a thickened peritoneal sac. Once an incision has been made into it, its character may be recognized by (a) the appearance of a yellow fluid, which, on examination, is found to be urine. This fluid may, however, be mistaken for the contents of a hydrocele. The muscularity of the walls cannot be relied upon, as the mucous lining may have ruptured through the fibres and form a thin walled sac, and also the bladder wall may be infiltrated with fat so that the muscular tissue is not recognized.

If the condition has not been recognized, and the sac therefore ligatured and removed, within 24 hours the patient will show signs of serious trouble. There may be inability to micturate, and the urine, when drawn off by a catheter, will be blood-stained. Again, if the portion of bladder wounded be intra-peritoneal, there may be signs of peritonitis, either local or general, in the event of the urine being infected.

**The Ocular Causes of Headache.**—Bedell (*Albany Medical Annals*, May, 1916), concludes his valuable article as follows:

1. Ocular headaches may be the result of a refractive muscle error or local inflammation.
2. Ocular headache, although most common in the afternoon, may be at any time of day or night.
3. The headache of middle life demands careful ocular examination.
4. Ocular headache may be present even with perfect distant and near vision.
5. In no case is the eye excluded until a cycloplegic has been used.
6. Occipital pain and nape of the neck discomfort extending even to the shoulders is often of ocular origin.

7. When proper, correct lenses are ordered, they must be worn as directed and must be accurately placed before the patient's eyes.



**Treatment of Diarrhea.**—Bretz in the *Amer. Jour. of Clinical Medicine* (Sept., 1916) says that while many of our patients will get well merely by absolute rest and careful dieting, there will be some in whom this condition will prove very obstinate and which try our skill to the utmost.

It is well to have some definite mode of procedure that will benefit all cases, and then to select our remedies to meet the various symptoms as they arise.

First of all, in this disease, as in all others, if we wish to be appreciated and receive the commendation of our patient, we must proceed to make him comfortable, and relieve the pain, tenesmus, and vomiting. This can best be done by means of a hypodermic injection of as small a dose of an opiate as will bring about this result, or, if the patient objects to the needle, 1-8 grain of codeine may be given by mouth. Also a suppository of 1-6 grain of aqueous extract of opium and 1-12 grain of extract of belladonna may prove quite efficient.

Wash out the colon with physiologic saline-solution. If we still suspect putrescing food in the intestine, remove it with a generous dose of castor-oil or a saline laxative. When the bowel is clean, keep it disinfected with the sulphocarbolates.

Do not encourage your patients to take food too soon. Give the irritated alimentary canal time to repair the damage and resume its normal condition. Order toast-water, barley-water, albumen-water (at first); then the soft foods, gradually getting back to the ordinary diet.

At this stage, Bretz finds a course of the Bulgarian bacillus tablets very beneficial, and he continues these for several weeks. The above procedure is for the simple diarrheas, but, in connection with the remedies indicated, it will prove beneficial in all varieties.

**A Serum for Typhus Fever.**—Such excellent results have been obtained in our own army, as well as in those of various European countries, by anti-typhoid vaccination, that it is encouraging to learn according to a writer in the *Scientific American* (Oct. 7, 1916) that there are prospects of similar benefits for the more dreadful scourge of typhus which has so recently been ravaging Serbia and other portions of the continent. Two French bacteriologists, Messrs. Nicolle and Blaizot, have lately made

public the results of their experiments to this end.

It was first proved that the serum from persons and animals who have recovered from exanthematic typhus possesses for a short time (from six to ten days after defervescence) preventive properties with reference to inoculation with the virus, though it has no positive curative value.

The next step of the experimenters was to prepare emulsions of the spleen and the suprarenal capsules of guinea pigs which had been experimentally infected with typhus, these organs being chosen because the typhus microbe is specially abundant in them. Since the horse and the ass support excellently inoculations with such emulsions they can be readily hyperimmunized by this means. Hence they were used for the next stage by the investigators. A large number of inoculations, extending over a period of about eleven months, were made in an ass with emulsion of the infected spleen. The ass was bled and the serum used for experiment after the thirtieth, the sixtieth, and the eightieth inoculations.

It was found that when monkeys and guinea pigs were inoculated with typhus virus and at the same time with the hyperimmunized serum, the latter prevented the development of the typhus. It was further proved that the development of typhus in guinea pigs could be checked if the serum was used at any time during the period of incubation of the germ. The essential point was that such intervention should take place soon enough.

Messrs. Nicolle and Blaizot next tested the serum on human beings, the results of 19 cases being recorded. All were cured; and the earlier the inoculation the more rapid the cure. While this is too small a number to be conclusive, the results are so promising as to give a strong hope that the researches now continuing will soon place the efficacy of the remedy beyond doubt.

**Cancer of the Uterus; its Surgical Treatment.**—Balfour in his interesting article in the *Texas State Jour. of Med.* (July, 1916) calls attention to the fact that cancer of the cervix presents quite different problems from cancer in other situations, and states that the operability rate in the Mayo Clinic is about 44 per cent. The major points in the symptomatology of the disease are reviewed and the necessity for a thorough examination at the first opportunity of any case presenting menstrual irregularity or vaginal discharge is emphasized.

In discussing the treatment of cancer of the cervix, stress is laid on the infectious nature of the process; and the importance in the cases in which total abdominal hysterectomy is performed of the most scrupulous care in the dissection of the malignant process so as to avoid as much as possible implantation carcinoma is also pointed out. The author states that his experience in connection with the low degree of heat as advised by Percy has demonstrated that compared with former results obtained

with the use of soldering irons, the Percy method presents distinct advantages. Heat as a preliminary measure in total abdominal hysterectomy is valuable both for its sterilizing effect on the infection which is present in the growth and for the improvement in the general condition of the patient which results from the cessation of the bleeding and the discharge. The value of radium is also recognized. The wisdom of adopting the typical Wertheim operation, with its initial high mortality, is seriously questioned.

Balfour believes that the basis of a successful propaganda against uterine cancer must be a lowering of the operative mortality and a lessening of the secondary sequelae.

He states that the general principles upon which cancer of the uterus is treated in the Mayo Clinic are as follows:

1. In early cancer of the cervix, thorough cauterization followed immediately by a total abdominal hysterectomy, the latter to be as radical as is consistent with the character of the case and the ability of the surgeon.

2. For moderately advanced cases, the use of heat by the Percy method, subsequent procedures to be decided by the results of preliminary treatment.

3. In advanced cases, a determined effort to ameliorate the symptoms and prolong life by heat, radium, etc., is occasionally rewarded by a result which permits of radical operation.

In all cases the extent of the operation is governed by the condition of the patient.

**Rectal Operations Under Local Anesthesia.**—Saphir (*N. Y. Med. Jour.*, Sept. 30, 1916) in his interesting article says that many cases, under the local influence of quinine and urea hydrochloride solution, were relieved of their rectal ailments, feeling no inconvenience either during or after operation, and each one attend his or her regular duties the same day or day after operation. These cases are interesting for many reasons.

1. It proves that rectal conditions can be cured under the influence of local anesthesia.

2. The patients need not be confined to bed, and can go about their business immediately after the operation or the next day.

3. It proves that rectal operations can be performed in the clinic, or for private patients at the doctor's office.

4. The consent of many patients who require rectal operations, but who fear the word "hospital," and shrink at the idea of being put to sleep under a general anesthetic, can be obtained when they are convinced that they can be operated on under a local anesthetic without pain.

5. Patients suffering with pulmonary tuberculous, nephritic, or cardiac diseases can with safety be operated on under the influence of a local anesthetic.

6. Many patients cannot afford to be confined in a hospital or at home for ten days or two weeks or more, as is customary in operations on the rectum under a general anesthetic.

The business or society man often cannot neglect or give up his business or social duties for two weeks or more, for the sake of having his rectum looked after. Working along the line of least resistance, he falls into the hands of quacks through their skilfully worded advertisements, or resorts to the use of salves, lotions, powders, or suppositories, and often neglects going to his doctor for a rectal examination, for fear that an operation may be necessary.

7. From an economic point of view, especially for the hospital and for the city, rectal operations under local anesthesia prove to be a great saving.

Saphir does not wish to be misunderstood, nor does he hold that all rectal cases should be operated on under local anesthesia. There are some cases that need hospital care and treatment, but he maintains that about seventy-five per cent. to eighty per cent. of hemorrhoids, external, internal, and thrombotic, rectal polypi, fissure ani, anal ulcers, dermoid cysts, tight or hypertrophied sphincter ani, skin tags, some cases of fistula ani, and some cases of prolapsus ani can and should be operated on under local anesthesia.

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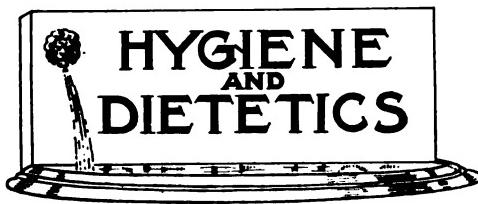
**Climate in the Treatment of Pulmonary Tuberculosis.**—Mills in the *Medical Record* (May 6, 1916) tells us that his own preference as to climate for the tuberculosis patient is New Mexico and western Texas. Many patients do well in Colorado, but it is too cold for a good many invalids.

New Mexico and western Texas have a maximum of sunshine, the greatest of all germ destroyers, and a minimum of rain. The altitude varies from two to five thousand feet, and that is a desirable factor. The air is dry and, to Mills' notion, has a distinct beneficial effect on the lung invalid. He spent nearly a year in that country for his own health twenty years ago, and he knows whereof he speaks.

The other places that are famous but nearer home he has not so much faith in. The lung invalid, if not too sick, will do better in the country away from tenements and crowded streets and city life generally, no matter where it is. But he does not believe that the true curative air is either in the Adirondacks or in the Carolinas, or in the other places that have a great reputation, except in the places he has mentioned—New Mexico and western Texas. The other places are of benefit because patients sent there are removed from vicious habits or surroundings. When he says vicious, he means physically vicious—unhealthful, not wicked. Sanatoria are numerous, but most of the health-seekers who go to them are benefited by the right living and by the care they receive rather than by the air they breathe.

In New Mexico and western Texas he believes the air itself is of curative value. In any of these places the health-seeker should place himself under the care of a local physician. That is likewise essential. Many lung invalids de-

rive no benefit because they depend on the climate alone and do foolish things. The health-seeker should place himself under competent medical supervision in his new habitat in order that he may know how to get the greatest benefit from his new surroundings.



**Clean Hands.**—Disease germs lead a hand to mouth existence, says a writer in the *West Virginia Med. Jour.*, Sept., 1916. If the human race would learn to keep the unwashed hand away from the mouth many human diseases would be greatly diminished. We handle infectious matter more or less constantly and we continually carry the hands to the mouth. If the hand has recently been in contact with infectious matter the germs of disease may in this way be introduced into the body. Many persons wet their fingers with saliva before counting money, turning the pages of a book, or performing similar acts. In this case the process is reversed; the infection being carried to the object handled, there to await carriage to the mouth of some other careless person. In view of these facts the U. S. Public Health Service has formulated the following simple rules of personal hygiene and recommends their adoption by every person in the United States:

*Wash the hands immediately—*

Before eating;

Before handling, preparing or serving food;

After using the toilet;

After attending the sick, and,

After handling anything dirty.

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**The Nutritional Value of Bread from the Whole Grain.**—F. Röhmann (*Berlin. klin. Woch.*, January 31, 1916) states that much of the protein of the grain is contained in the layer immediately beneath the pericarp and is not utilized when eaten as ordinarily milled for whole grain bread. Aleuron cells can often be found whole in the human stools after the use of such bread. When, however, the grain is very finely ground so as to pulverize this hard outer layer a much larger proportion of its protein contents is made available. Bread made of such finely milled whole grain has a much higher nutritive value than ordinary bread and provides so much additional protein that it very largely spares the much more expensive protein foods, such as meat. In addition to this the outer layer has been found to contain certain substances necessary for growth. Funk has termed these "vitamines" and ascribes to them

certain specific growth stimulating properties. Röhmann does not subscribe to the theory of vitamines, but holds that the endosperm, which is the only part used in fine flour, is wanting in certain essential protein constituents—particularly those yielding lysin, arginin, and tryptophane. Just these essential constituents are, however, present in the protein substances found beneath the pericarp and which are available to man only in flour made from the whole grain, and specially in that which is finely milled. The use of such bread is therefore not only decidedly economical, but also provides a much more complete diet on the protein side.

seems to savor of empiricism. In parts of Scotland warts on the hand are supposed to vanish with great celerity should they be anointed each morning with the first spittle formed by their owner's salivary glands after awaking. The most extraordinary part of the story is that there seems to be a degree of truth in it. In America the curative power of spittle is vouched for by many of the intelligent classes. The wounds of dogs are said to heal best if treated solely with the injured animal's tongue.

The Gaelic race has ever been deeply absorbed in legendary fancies and mythical creations, many of which are connected with spitting. Ireland is noted for its many evil minded people. In many cases the evil minded person is compelled by the injured man, on pain of bodily damage, to spit upon the object of his pretended admiration, and at the same time to invoke a blessing on it. Admiration from an evil minded person is always regarded as of ill omen. In Connemara a bowl is sometimes sent around the neighborhood, and each person to whom it is presented is expected to spit into it. The bowl is then taken home, and the person or animal overlooked is anointed with spittle. The object of this is to obtain the spittle of the person responsible for the injury without giving him offense or awakening his suspicion, as a direct appeal to him would be certain to do.

In many parts of Ireland thrush in children is cured by having a posthumous child blow into the mouth of the sufferer. The blowing must be done by the operator while fasting, and is generally repeated on three successive mornings. In county Meath the cure of warts is accomplished by first spitting upon the hearth immediately after arising; following this a second installment of saliva is hawked up and applied to the wart. In applying the spittle to the wart the second finger must be used. The use of the first finger would be disastrous. In county Mayo styes are treated by liberal applications of spittle.

In certain parts of Ireland, principally the west, the name Mearnan and spittle are indissolubly linked. A woman by the name of Mearnan with an evil eye made admiring remarks on the limbs of her neighbors. These words of admiration caused all of them to become cripples. One young man whose feet she deformed by her complimentary remarks, compelled her to bless his feet and spit upon them. His limbs were soon restored to their normal condition. One of the Mearnans was so well aware of the blighting influence of his evil eye that upon entering a home to pay a visit he would always spit upon and bless each member of the family before sitting down.

Superstitions are said to die hard; and it would seem from the foregoing facts that the one under discussion has been endowed with a phenomenal vitality. Despite its absurdity, filthiness, and unhygienic character, the salivary superstition has still survived; whereas, on sanitary grounds, it should, without further loss of time, be buried and never be revived.

**Salivary Superstitions.**—King (*New York Med. Jour.*, July 22, 1916) says that the habit of promiscuous expectoration is an uncleanly and disgusting one, and yet, strange to say, it is surrounded by much superstition. In days of antiquity spitting was resorted to in order to ward off danger, and up to the present time luck is wooed and misfortune avoided by the process of spitting. Newborn children are treated to a lavish expectoration by a certain class of midwives; fishermen spit upon their hooks after baiting them. It is considered by some to be absolutely essential before washing in water in which a friend has washed to spit into it, otherwise a quarrel is sure to follow.

But it is in old Europe that the superstition of spitting seems to reach its worst degree. In Oldenburg, for example, the loathsome custom prevails of always spitting three times into the kneading trough before the dough reaches the oven. Again, babies in Hungary are especially singled out as the objects of the superstition; the custom there is to spit into the baby's face in order to bring it good luck. Imagination almost fails to picture the filthiness and danger of such a disgusting act. In Silesia and Bohemia, persons generally spit three times when they meet an old woman, but it is quite difficult to conceive why the presence of an aged female should call for such a profligate evacuation of the salivary secretion. In Sweden a great deal of superstitious spitting also takes place. Persons spit into their beds before retiring; playing cards are spat upon when luck is bad, and every new suit of clothes is made the object of a salivary demonstration.

The widespread belief in the wonderful powers possessed by saliva is, however, not always allied to imaginative superstition, but often

# American Medicine

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**A Thanksgiving Thought.**—Days of Thanksgiving were not uncommon among the ancients as expressions of rejoicing for some great victory won by a national hero. National triumph, national preservation, and national conquest were the occasions of numerous festivities.

Governor Bradford, the first governor of the Massachusetts Colony, set apart the first Thanksgiving day for prayer, feasting, and rejoicing on December 13, 1621. The religious ceremony was supplemented by unusual indulgences in feasting. For many years, days of this character were set apart as frequently as specific occasions appeared to warrant it. It did not become a formal annual festival until 1684.

Washington ordered a general Thanksgiving for the Continental Armies during 1777 and 1778. In 1789 a national Thanksgiving Day was appointed at the request of Congress. There was little regularity in recognizing this festal day until Lincoln issued his proclamation for its observance of August 6, 1863. Its appeal was strong because it succeeded the Battle of Gettysburg. From the following year until the present time, the last Thursday in November has been recognized as the Day of Thanksgiving.

While carnage despoils Europe, our nation is sympathetic, regretful, and suffers many sorrows in vain. With truer values in life, with prosperity abounding, with

crops plenteous, with social ideals increasing in number and breadth, there is every reason for this country to pause in its daily routine for the purpose of reflection, contemplation, and prayer.

**The medical profession may well be thankful** for its opportunities to serve humanity. Despite the storms of competition and regardless of the daily struggles incident to extracting a living thru the care of the sick, its place in human welfare is recognized as representing the essence of all that is worthwhile in life.

The new developments of medicine yield abundant opportunities for personal service such as reflect most creditably upon the intelligence, the conscience, and ideals of this age. Well may the profession rejoice and proudly participate in the banquet with a conscious realization of sincere effort, honest purpose, and practical idealism.

As citizens, we rejoice in the welfare of our country, in its general development, its aims, its freedom, and its spirit. As public servants, we give acknowledgement for the protection afforded in the development of our professional life. We admit that full recognition has not been given to our worth, to our honesty, to our conscientiousness, and to our service. For this we harbor no feelings of ill will. Ours is the responsibility to convince the nation of our merit. We can freely confess our weak-

nesses and our imperfections without the loss of self respect. We are human beings with normal frailties attempting to rise to higher planes. We can only be thankful for what we have accomplished and be hopeful for what lies before us. With a strong wave of social sentiment sweeping across the continent, we find ourselves engulfed and shall be obliged to swim to a safe haven or be lost in the struggle.

With meditation and hopeful prayers, the profession faces the future. The practice of medicine is evolving a more rational basis. Health is being recognized as a national asset. Physicians are to be the conservators of public health.

The progress and onward march of civilized nations is marked by cold monuments erected in memory of deeds of valor, feats of strength, patriotic efforts, accomplishments in art, literature, and music. How rarely do the stone tablets bear witness to the peaceful preservation of national health, to conquests which have added to the lives of nations, contributed to their upbuilding and aided in their establishment upon a firm foundation? It has been said that the man who needs a monument to be remembered merits none. From this point of view, the medical profession needs no towering shafts to record its victories. The successes achieved in the battle against disease are their own greatest memorial. The dead are esteemed for their accomplishments; the living are honored for their efforts.

At this season of thanksgiving, let us pause for a moment in silent grace for those who have given their bodies, their minds, and their lives to the peaceful arts and sciences. Let us utter gracious thanks for those whose patiently acquired knowledge, self sacrificing devotion, patience, earnestness, and enthusiasm have sought to bring

succor and health to the nation. Let us be thankful that we are enrolled in a profession that has been enriched and sanctified thru their lives and efforts. Contemplating the brilliant inspiring history of our profession, let us dedicate ourselves to even greater future service.

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**Simplified Spelling.**—Orthography like nations has its evolution. The English language is constantly growing and being enriched by the addition of new words. The immigration of people from foreign lands, colloquial expressions, the rise and fall of institutions, the developments of science have made their marks upon the English language so that a knowledge of its philology involves the history of civilization.

The writers of the day give comparatively little thought to the historical relations of the words they utilize. They merely select their words to convey their thought.

Thruout the years orthography has undergone constant change. The transformation of words has been slowly effected and the average reader has not been cognizant of the alteration of the appearance of the printed page.

Common usage is generally accepted as the best authority for spelling, but the habits and customs of the multitude are conservative. In no instance is conservatism better exemplified than in the resistance to spelling reform. The speakers of English are conservative. The phonetic spelling appears to violate some unknown law and consequently is opposed. At the present time our system of spelling is unscientific, lacking in historical verity, inconsistent in phonetics and unfortunately lacking in uniformity in pronunciation.

Gould in his dictionary was the first to apply the principle that the diphthongs oe and ae be supplanted by e. This usage has grown more and more popular and today we find in common use such words as anemia, hemorrhage, gangrene, cecum, edema, esophagus and are neither shocked nor horrified. The word meter and liter have taken the place of metre and litre. Gram serves instead of gramme. Anatomic is used in place of anatomical. Labor has driven out labour. Lachrimal has superseded lachrymal. Reforms of this character have crept into existence almost unrecognized by the majority of persons, though there has been much opposition from various sources to their adoption.

**Phonetic spelling is eventually bound to succeed.** Chaos in orthography must give way to order. Simplified spelling is necessary for the improvement and advancement of our heterogeneous population. Every reform first encounters opposition, is then favored by a few, and finally receives the support of public opinion. This has been especially true with every advance in education.

As long as language is for the purpose of conveying thought, the problems of philology may be left to the scholars who are interested in this branch of literary and historical science. The tendency to adapt the English language to the needs of the day with a view to securing simplicity and practicality is of the utmost concern. The problems of etymology or the consideration of esthetics are not to be the decisive items in securing a practical language easily learned, spelled and used.

It is with a sense of pride that we call attention to the importance of accepting the general principles of simplified spelling,

because of the fact that Dr. George M. Gould, the first editor of AMERICAN MEDICINE, was a vigorous force in advocating orthographic reforms and introduced them directly to the medical world through the medium of the excellent dictionary bearing his name.

At the present time, the editors of the most important dictionaries of the English language have given their approval to the simplified spelling movement and newspapers of a combined circulation of more than 14,000,000 are making use of simplified spellings as advocated by the Simplified Spelling Board.

In 1898, the National Education Association recognized the importance of the subject by deciding to advocate the adoption of twelve words as the beginning of educational reform in this direction. The list adopted by the National Education Association includes the following words, spelled in the form given: tho, altho, thru, thruout, thoro, thoroly, thorofare, program, prolog, catalog, pedagog, decalog. These words have all received educational recognition and merely require educational support thru their extended use in newspapers, journals, and current periodicals.

With this issue, AMERICAN MEDICINE desires to take its place among the leaders in spelling reform. We believe that it is advantageous to establish simpler and more regular spelling in harmony with the genius of our language. There is a distinct advantage in making it easier to spell correctly. The adoption of these twelve words accomplishes a saving of 31 useless letters. It will save time in education, decrease expense in printing, remove obstacles to the Americanization of our foreign population. The simplifications with which we begin our reform have been acknowledged as

proper and desirable by the National Education Association and the Modern Language Association of America. They have been adopted by 290 colleges and normal schools in this country and have been accepted by 317 newspapers and periodicals either in whole or in part.

We recognize that this is but the continuation of the process of spelling reform which historically began at least as early as 1554. It is a continuation of the evolution of language. It is placing the imprint of public approval upon a few definite phonetic reforms which appeal to reason and common sense.

Having established this rule for ourselves, we invite the cooperation of our contributors in facilitating the publication of their articles by adopting these twelve words in manuscripts submitted to AMERICAN MEDICINE.

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**Dietetic Deficiency.**—For many years discussions of nutrition took cognizance of the relative amounts of protein, fats, and carbohydrates. The caloric equivalents of foods were accepted as indicating their maximum available food value. The discrepancy between the number of calories ingested and absorbed was recognized. Nevertheless, the worth of a ration was determined by its caloric content and the three main constituents entering into its edible form.

Chemical investigation unfolded the facts that individual proteins vary greatly, depending upon the character of the amino-acids they contain. Proteids lacking in these amino-acids were found to be unsatisfactory in maintaining the nitrogen equilibrium of the body. The inorganic salts of foods were generally disposed of under the head of ash content. The mineral metab-

olism of the body was soon recognized as being vital to its welfare, and studies of the occurrence in the dietary of iron, calcium, magnesium, potassium, sulphur, chlorine and phosphorus now indicate their importance in bodily nutrition. Problems in metabolism no longer end with caloric requirements, but include the consideration of the mineral metabolism and the presence of somewhat undetermined substances essential for the complete and healthful functioning of the body.

**Vitamines** are the most recent addition to nutritional physiology. Despite ingestion of excessive quantities of fats, carbohydrates, proteids, and inorganic salts, there may result a loss of weight, decrease in cardiac tone, blood deficiencies, and defects in the bones, the muscles, the skin, if sufficient vitamines are lacking. The presence of these living vitamines is paramount for the maintenance of health.

The scientific investigations of the past five years demonstrate the existence of specific nitrogenous substances, small quantities of which are necessary for the maintenance of life.

As a result of the discovery of vitamines and their subsequent study and investigation, great progress has been made towards the elimination of various diseases, the etiology of which has long baffled clinicians. Air, insanitary environment, heredity, infection, uncleanliness, overcrowding, and numerous other causes were adduced to account for the development of scurvy, pellagra, beriberi, and various other diseases now proven to be what are called deficiency diseases. Their continuance and persistence, despite the efforts of sanitarians, is now accounted for. There had been failure to assess a proper valuation upon the place that foods

play in the etiology of disease because the vitamines had not been discovered.

The extent to which vitamines are involved in the maintenance of health is far from determined. The degree to which cooking is responsible for the destruction of these important substances remains to be demonstrated. It is however, patent that eggs, raw milk, fresh fruits, fresh vegetables, and unmilled cereals are necessary in the daily dietary, in order to lessen the likelihood of losing the benefits conferred by these very important life sustaining bodies. Deficiency diseases are unlikely to occur during the maintenance of a well-balanced dietary including uncooked foods, such as those mentioned.

**The conquest of beriberi, scurvy, and pellagra** is a notable achievement. The determination of the methods by which they may be eliminated reflect credit upon the science of nutrition. Undoubtedly, it will take many years before the available information regarding the importance of vitamines filters thru the scientific population and reaches the masses.

Fortunately, the food stuffs, apparently richest in vitamines, are among those most common and cheapest in prices. This in itself is a happy circumstance, as it places within the means of the public an opportunity for the prevention of serious disabilities without taxing their means to any extent.

It is advisable for those making extensive use of special diets in the treatment of disease to recognize the importance of the vitamines for the well-being of the body. There are many instances recorded where deficiency diseases have resulted from improper dietaries advised and urged by specialists.

Insistence that all foods be cooked carried with it an inherent hazard of a deficiency disease. The total exclusion of fresh fruits, and fresh vegetables for long periods of time involves the danger of upsetting nutritional equilibrium. Now that the elimination of deficiency diseases is in sight, there is no excuse for their development as a result of efforts at therapy in other conditions, functional or organic in nature.

The study of the deficiency diseases has uncovered a large field for investigation which must redound to the increased health of the community.

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**Uncovering Weil's Disease.**—Forty years ago Weil of Heidelberg announced infectious jaundice or febrile jaundice to be a definite disease, altho he did so with the mental reservation that it might possibly be some peculiar modification of an infectious disease already known. Its etiology has long been shrouded in doubt, but the occurrence of the greatest number of cases during the summer months, particularly among individuals in insanitary surroundings, made it appear probable that some infectious agent was responsible for its origin.

Jaeger, in reporting an outbreak in 1892, discovered a supposedly causative organism to which he gave the name *Bacillus proteus fluorescens*. His investigations included a demonstration that some of the water fowl suffered from a fatal disease somewhat similar in symptomatology and he reported the discovery of the same organism in these water birds at post mortem examinations.

Little advance had been made in bringing to light further etiological agents until recently Uhlenhuth and Fromme announced

the discovery of definite spirochetae which had been recovered from the liver. By inoculation into guinea pigs of blood from infected individuals, they were able to produce the disease and were able to transfer the infections from guinea pig to guinea pig. Attempts at artificial cultivation have been successful and the ability to develop active immunity in guinea pigs and in human beings and the experimentations in passive immunization by means of an immune serum serve to indicate the probability that the causal infective agent actually has been discovered. This work marks an advance in the study of Weil's disease.

From the standpoint of therapeutics and prophylaxis further investigation is necessary but the advances to be made will undoubtedly lead to the clearing up of some of the numerous problems which infectious jaundice has presented to the clinicians and health officers. Apparently, there is every reason to believe that the control of Weil's disease and its prevention are assured facts.

**Prophylaxis.**—Ido, Hoki, Ito and Wani (*Journal of Experimental Medicine*, November 11, 1916) believe, as a result of experimentation on guinea pigs, that prophylaxis is to be secured thru active immunization.

The pathogenic spirochetae are excreted thru urine and feces, which must be safeguarded to prevent dissemination of the disease.

A point of practical importance is that house and ditch rats carry virulent *spirochetae icterohemorrhagiae* in their kidneys which are excreted with the urine. Rats are shown to have some causal relation to Weil's disease. The disease may be transmitted to man directly or indirectly from the rats' urine.

The serious significance of this discovery is recognized in connection with the development of many infections with Weil's disease among soldiers fighting in trenches overrun with rats.

Thus, science in its constant warring against disease has taken another prisoner or at least has made a successful attack upon an enemy of no mean force and power. Inasmuch as the European struggle has thus far presented comparatively few medical advances, it is to be hoped that these researches upon this one of the prevailing diseases will be confirmed. Medical militancy can record another satisfactory achievement if Weil's disease is hereafter to be included in the category of those infections whose natural history is thoroly understood and whose mode of prevention and cure is to be a matter of common information.

Unfortunately, the mere determination of etiological factors and the knowledge of modes of prevention do not assure the elimination of the disease. Our experience with typhoid fever and malaria, concerning which complete data are now available, indicates that the mere possession of scientific facts is ineffective for securing complete control of these diseases or indeed of bringing about their total subsidence. The scientific advances of medicine must needs be crystallized into popular opinion and educational advantages must be afforded for popularizing such knowledge to the widest extent. The marked diminution of the infant mortality rate bears witness to the possibilities of attainments in preventive medicine thru the medium of organized, systematic, popular education.

If it be true that the cause of Weil's disease has been discovered and that immune sera are effective for determining active or passive immunity, it is reasonable to hope

that the disease will be decreased and its mortality lessened. The profession cannot, however, lose sight of the fact that these same facts are known with reference to diphtheria which has not been placed in the category of obsolete infections.

It is true, however, that the ascertainment of the fundamental facts are essential for building up rational plans for the control of any disease. Our German and Japanese colleagues have given much valuable information, which if corroborated by other clinical and laboratory workers will establish a scientific basis for the erection of another milestone on the road of medical progress.

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**The Unwed Father.**—During the early part of the war much discussion was created by the subjects of war brides and war babies. Nations were stirred by the economic, social, and moral questions involved by a promise of an increase in the number of unwed mothers and of children whose paternity could not be established with certainty. There was no novelty in the question. It simply attracted public notice because it was believed to constitute a very vital problem with an unusual significance derived from the fact that repopulation was certain to be a national problem concerning which some policy had to be established.

The terms illegitimacy and bastard have distinct legal meanings and must be recognized as such regardless of whether justice and right warrant stigmatizing the mother and the child because of biological consequences attendant upon unconventional actions, as well as upon those legalized.

American statistics are notoriously weak in supplying information regarding the number of unwed mothers or the number

of children born out of wedlock. The Cleveland Conference on Illegitimacy has presented figures for the number of illegal births in some of the cities of the middle West. The percentage in Cleveland was found to be 2.26%, St. Paul 3.7%, St. Louis 4.2%, Minneapolis 4.6%. It is acknowledged that these rates are low owing to the failure to maintain accurate birth registration statistics.

According to the Cleveland Conference, the leading causes of illegitimacy are feeble-mindedness of the mother and the moral dangers of occupations, such as housework. It draws attention to the unusually high death rate among babies born out of wedlock and the facilities afforded mothers to dispose of their children before the period of nursing is over.

In the consideration of the unwed mother, one hears very little of the unwed father. It would appear to be a matter of justice that co-responsibility in creation carried with it co-responsibility after birth. As a matter of fact, however, the mother who bears the child usually is deserted and must carry the burden alone, unaided and unprotected. If it were possible to secure the support for the mother from the father during pregnancy and childhood by demanding and securing weekly or monthly settlements until the child is of self-supporting age, there probably would be a decrease in so-called illegitimacy. There would certainly be greater justice for those suffering under the present system. Public health would be advanced and the infant mortality rate would register another decrease.

If feeble-mindedness be the main factor in this problem, numerous problems for the supervision of feeble-minded girls arise. The expenditure of funds for safeguarding defective girls is legitimate and desirable,

not merely from the standpoint of safeguarding the weak-minded potential mothers, but for the purpose of protecting society from births from such sources, which usually result in inferior stock.

It is difficult to determine upon a single plan which will eliminate the moral hazards of certain occupations. This must of necessity be a slow process, depending as it does upon the acceptance of higher moral standards than exist today. It means education in ethics and morals, in science and religion, until high standards of conduct become organized in daily living.

**The sexual aggressor** is most generally masculine in gender. It is striking and suggestive that matings between defective women and normal men far outnumber the marriages of defective males and normal women. This implies that the education of the male particularly must be stressed in order to remove the moral hazards of occupation.

The entire problem of the unwed mother and her child must be solved thru the co-operation of all social agencies. The departments of health, of charities, the tenement house bureaus, the courts, the corrective institutions, the hospitals, and physicians have given inadequate attention to this important phase of social welfare. The oversight of individual cases may affect a few unfortunates in the community, but a distinct advance cannot be made until the problem is grappled with in its entirety and definite steps are taken, as a part of broad civic policy to cope with the evil and its attendant unfortunate consequences.

The first step to be taken in securing control of the situation requires the careful and thoro administration of birth registration. Laxity in the administration of laws favor-

able to the accumulation of accurate vital statistics is not to be condoned. It is insufficient to know part of the number of children born. It is imperative that all be enumerated. It is equally important that the full data be recorded concerning both parents, and furthermore whether such parents have been legally married. Until this simple reform has been inaugurated it will be impossible to develop a rational plan for communities to meet the needs of the unmarried mother. The problem of population is complicated and involves more than numbers. The interpretation of present day tendencies is hampered by the lack of adequate information concerning parentage. This generation owes it to the future to adopt measures which will provide more adequate facts than are at present available. In the United States, there are no problems concerning the existent population.

Physicians might well make their contribution to the advance of social justice thru revealing the facts as ascertained in maternity hospitals, maternity clinics and in pediatric services where paternity may be made the subject of investigation. In many ways the unwed mother and her child are bound up in attacking the problem of the unwed father. The three form a unity and must be considered together from the standpoint of heredity, eugenics, sociology, economy, and public health.

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#### **The Home in Public Health Activity.—**

The progressive changes in the administration of public health are well illustrated by Charles V. Chapin (*American Journal of Public Health*, September, 1916) in discussing 60 years of the Providence Health Department. Providence has been fortu-

nate in that there have been only two health officers during 60 years. Permanency of service promotes continuity of policy and affords an opportunity for a conscientious, scientific health officer to attack consistently the health problems of the public.

There have been three marked stages in public health activity. The first efforts were designed to restrict the spread of diseases dependent for spread upon human excrement, namely, cholera, typhoid fever, diarrhea and dysentery. For this purpose numerous advances were made in sewer construction, house drainage, general municipal cleanliness, and the protection of water supply.

The second period of public health activity was characterized by the control of the directly contagious diseases thru isolation, disinfection and vaccination. The decline in smallpox, scarlet fever, and diphtheria attest the valuable results achieved.

The third phase of public health activity is the type existent today. It emphasizes the importance of the education, direction and supervision of mothers in the care of their infants. It points out the necessity of providing adequate machinery for the general improvement of medical service in the community. It stresses the dissemination of knowledge concerning the prevention of diseases. The marked reduction in tuberculosis, the decrease of infant mortality, the investigation of the physical defects of school children, with attempts at their correction, mark the principal lines of service at present considered of paramount importance by health departments.

**Teaching people how to live**, instructing them in the essential principles of personal hygiene is at the foundation of modern, in-

telligent health efforts. It is a short-sighted policy merely to urge extensive municipal improvements for the purpose of remedying existing ills. Many of these very ills may be controlled at a minimum expense thru educational measures. If individuals are responsible for the spread of disease; if their methods of living are unhygienic; if personal contact is the main factor in infecting others, the establishment of hospitals, dispensaries, and convalescent homes fails to place the emphasis upon the importance of the individual in decreasing and controlling the infective processes.

Health solidarity is to be achieved thru the general cooperation of all agencies for the instruction of the young and the adult in the principles underlying healthful living.

The home has become the recognized center of public health work. Herein the greatest good is to be accomplished. Here are the infants, the school children, the workers. Here are the food problems. Here are the sick. Here are the well.

The strategic importance of attacking infant mortality problems, of solving tuberculosis problems needs no argument at the present time. The control of communicable diseases within the home will accomplish more immediate results than any other single piece of health work in the community.

**The reduction of infectious diseases** will be attended by a natural decrease of the diseases of the heart, kidneys and blood vessels which will redound to the advantage of a community in the years to come.

It is obvious that calling attention to the importance of education of the home in hygiene does not minimize the importance of the activities of health departments which aim to establish healthful conditions

along lines which are beyond familial control. The furnishing of an adequate supply of potable water can only be secured thru the spending of public money. It is patent, however, that teaching the importance of boiling water for drinking purposes, when doubt as to its purity exists, would place safety within the possibility of every family. The control of food supplies, the inspection of school children, the collection of vital statistics, the municipal organization of dispensaries, clinics, hospitals and laboratories, factory inspection, street cleaning, sewage disposal are all fields of activity which merit constant attention as beyond family jurisdiction.

Considered from the standpoint of the damage to the community, the ratio of communicability and preventability, as well as the communal cost which follows, it is beyond dispute that the control of communicable diseases and instruction in infant hygiene assume an unusually striking value. To attack these diseases, the home presents a natural basis of approach. All the powers, intelligence and money available should be directed into this channel.

The present era of public health activity marks a great advance in methods over those utilized previous to the twentieth century. The modern conception of the prevention of disease or, better, the conservation of health prevails and herein lies the secret of success in public health administration.

#### Things that Count.

Not what we have, but what we use,  
Not what we see, but what we choose—  
These are the things that mar or bless  
The sum of human happiness.

The things near by, not things afar,  
Not what we seem, but what we are—  
These are the things that make or break,  
That give the heart its joy or ache.

—*Jour. Nat. Med. Assn.*

**The Chicago Medical School**—The establishment of a new medical department of the University of Chicago along continental lines represents a notable advance in American medicine. The famous Rush Medical College will pass into history, not because it has outlived its usefulness, but because it recognizes that thru its dissolution a greater institution may be born.

The prospective medical school is to be manned by able men in the professorial staff whose lives are to be devoted to the teaching of medicine. The medical teacher assumes a new professional standing. Medical teaching seeks far higher standards than could be achieved by equally capable clinicians devoting a large part of their time to the development of their personal practices. The Medical Department of the Chicago University will be organized in teaching plan like Johns Hopkins University and Washington University, both of which employ full time professors.

The standards for entrance in the new institution probably will be raised so that a college degree, with special work in chemistry, physiology, and biology, will be required for entrance. This in itself makes possible the highest and most thoro type of medical teaching.

It is understood that the Presbyterian Hospital of Chicago is to be taken over by the University and to serve as the basis of hospital instruction for the student body. It is to afford facilities for actual clinical research in every department of medicine. It is to be the true center of post graduate instruction. The status of the post-graduate hospital does not reflect as creditably upon the American medical profession as do similar institutions which have been the Mecca for physicians in the pursuit of advanced knowledge of the specialties, in pathology, chemistry, and the biological aspects of medicine.

Ever since Abraham Flexner made his celebrated report on American Education in the United States and Canada, there has been a growing effort to raise the standards of our medical institutions. It has been recognized for a long time that the existing system causes an over production of medical men, whose general average of efficiency is not as high as is desirable, considering the nature of the work undertaken by them. Society needs the best physicians procurable. Monetary considerations are not the actuating motives of the bulk of the profession. If the average medical skill is below the standard deemed necessary, the graduates in medicine themselves are not blameworthy. The responsibility falls back upon the institutions which sent them forth untrained, substandard, and even incompetent.

**Our post-graduate schools** practically originated as "undergraduate repair shops." A higher ideal for the post-graduate institutions is necessary. Their existence is not to be based upon the necessity of giving the instruction which was inadequately offered or imparted to the students while undergraduates in ordinary medical colleges. Their purpose should be to extend the knowledge of medicine in all of its branches to those whose ambition and interest impel them to seek it and to delve into the numerous mysteries still unsolved.

It is difficult to standardize medical schools. The most effective way of eliminating the low grade institutions is by establishing higher grade institutions. By so doing and by educating the general public as to the importance of demanding high standards of medical proficiency students will gradually forsake the inferior colleges, whose existence depends entirely upon the willingness of men and women to accept a form of education acknowledged to be of substandard type.

The profession can hail this new departure only with approbation. Its organization would be followed with interest. The selection of the teachers demands great care in order that the high purpose may not be subverted thru failure to secure those persons most capable of imparting medical principles along scientific lines in the most efficient and practical manner. A knowl-

edge of medicine is not synonymous with pedagogic ability. In the employment of full time medical teachers proper emphasis must be given to the ability to teach, as well as to the possession of a wide knowledge of the subject matter to be taught.

With the millions of dollars now expended for agencies of destruction, there is a sense of gratification in contemplating the constructive value of this modernized medical school. May it assume an important position in the educational world thru advancing the interests of theoretic and practical medicine and by helping to supply the country with a more capable, tho not more conscientious, type of practitioner.

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**Venereal Museums.**—For many years the charlatan has ruled supreme in the direction of anatomical museums with consultation office attachment. Recognizing the psychological value of exhibits of this character for creating fear in the minds of adolescents and adults, the quack has been able to exploit the unthinking visitors and in the past has reaped a commercial harvest.

In order to combat the iniquities existing in this form of public commercialization a sound plan has been devised which accepts the advantages of the plan but adapts it on a high plane to the needs of the public. The Society of Sanitary and Moral Prophylaxis with the cooperation of the American Federation of Sex Hygiene established a Social Hygiene Exhibit at Coney Island to which entrance was free. Lectures and guides were in attendance to explain the true meaning of the models, charts, drawings, and literature, so that there could be no misinterpretation of their meaning and personal application. Of greater significance, however, were the consultations arranged for those seeking information for which no charge was made. By this simple method of utilizing the venereal quacks' weapons an intelligent step has been taken in combatting the evil.

Institutions of this character under the auspices of reliable scientific, and quasi-philanthropic organizations are to be unhesitatingly commended. Similar exhibits might well be employed to travel thruout the States, stopping for short periods in

towns, villages, and cities, which do not feel able to afford the creation of such practical educational measures.

The helpful guidance and direction of visitors in the interpretation of the meaning of venereal diseases for the future of the race cannot be other than beneficial. The fact that there is no commercial interest in the visitors, but the dominating desire is to afford instruction and to create higher planes of health and morality, is a guaranty of sincere purpose, and must meet with a cordial and grateful acceptance by communities.

The non-commercial health museum presents unusual opportunities in public health work. The health trains which have been employed in many States of the country and the itinerant health conferences, as for example those planned by the Southern Sociological Congress, represent constructive efforts at organized education with manifest positive benefits free from objections. The greatest difficulty in connection with movements of this character, however, is to secure lecturers with the adequate knowledge of the scientific facts, with a deep perception of crowd psychology, with tactful utterance and the ability to give free expression to their views and the power of satisfactorily answering the questions which not alone naturally arise but are desired as an index of stimulated interest. Herein is a wide opportunity for work along the lines of public health extension.

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**The Federal Compensation Act.**—In the application of ethical principles, one would expect to find the best examples of justice among those of highest intelligence. The effect of education upon the development of criminality has not manifested the most desirable results. The failures of moral standards and ethical impulses among the best educated possibly stand out more prominently on that account, but nevertheless, proportionate to numbers, the educated criminal is in excess of the general average of population.

While it is not analogous to point out that the example of the Federal government should be the first to present reforms of immense social significance, it is not unfair to demand that the Government of the United States should treat its employees

with an equal consideration and justice as that demanded by many of the component States for ordinary employers of labor.

Workmen's compensation acts are slowly becoming general thruout the country. The Federal Act of 1908 made provision for possibly one-fourth of the Federal employees. On September 7th of this year, the President signed an act to provide compensation for United States employees suffering injuries while in the performance of their duties. As originally drawn, the act provided for compensation for occupational or industrial diseases, but in its adopted form all reference to these were omitted. Personal injury is to be the condition for which compensation is provided.

The act provides for benefits on a basis of two-thirds of the wages of the injured employee with payments continuing as long as the disability lasts. Partial disability is compensated on the basis of the wage loss resulting from the injury. There are death benefits to widows and to children as had been provided in similar state enactments.

It is commendable that Congress favorably acted upon this bill and has placed Federal employees, numbering practically one-half a million individuals, among those for whom adequate compensation laws have been effected. The distinct trend towards the socialization of government is manifest in the legislature of the country.

**The responsibility of employers** is not limited to individual organizations but must be felt by municipal, state and national governments. Laws of this character are to be regarded as public health laws because of the tremendous part they play in decreasing poverty, invalidism, and physical deterioration of the citizenry. The provision of reasonable medical and surgical care and hospital services makes it possible for prompt measures to be taken to safeguard the welfare of the employees, to prevent sepsis or other complications, and to afford an opportunity for more rapid convalescence.

The personal advantages gained by the injured employee are in a sense of paramount importance, but no less significant are the advantages in health accruing to the families of the injured by reason of the compensation afforded which enables them to secure the necessities of life of which

they might otherwise be deprived. The confidence of the cooperation and interest in their own welfare is a psychic factor far from negligible in determining the maintenance of more adequate health standards in the home.

A social worth of federal laws is also manifest thru the educational results which are achieved thru the knowledge that the government appreciates the value of advancing the general health and welfare of its citizenry, and particularly that portion of it which is intimately concerned in carrying out the numerous projects projected under governmental auspices. The Federal Compensation Act is a step in the right direction and places our Government with the advanced nations, which for a long time past have recognized the importance of legislation of this character. Public health possesses a new force in the industrial world as a result of this development of governmental justice.

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**Cancer.**—The American Society for the Control of Cancer and the American Association for Cancer Research are actively engaged in disseminating the salient facts of the cancer problem with a view to awaking interest on the part of the public in the importance of early diagnosis and adequate treatment during its initial stage.

Hoffman has dedicated to them his excellent contribution on *The Mortality from Cancer Throughout the World*. From the vast amount of material that he has collected and statistically organized, he points out that the rate of mortality from this disease is increasing approximately at the rate of 2½ per cent per annum in the United States. He describes the statistical basis of cancer research and thoroughly discusses the numerous statistical problems involved in estimating the extent and nature of cancer mortality.

The occupational factors entering into cancer development, together with the geographical incidence of cancer throughout the world, are fully discussed and serve as fundamental items in arriving at his conclusions on the cancer problem. Some of his conclusions may be quoted, isolated from the context, in order to indicate the results of his analysis and to demonstrate the breadth and carefulness of his observations.

It is maintained that this vast amount of general cancer mortality information is in sufficient agreement to warrant the far-reaching conclusion that the menace of cancer throughout the civilized world is much more serious than has generally been assumed to be the case.

The conclusion is advanced, and without hesitation, that the evidence of cancer increase throughout the world is an incontrovertible statistical fact, and absolutely conclusive.

The mortality from cancer is increasing at a more or less alarming rate throughout the entire civilized world and that this increase implies most serious consequences, present and future, to the populations concerned.

It is readily conceded that at the present time the available cancer statistics by occupations are of rather limited practical utility; but it is suggested that thoroughly qualified and highly specialized inquiries in this direction are quite certain to yield important results.

Practically all forms of cancer are on the increase, but naturally to quite a variable degree.

Cancer frequency decreases with diminishing distances from the equator, or, what is practically the equivalent thereof, a rise in cancer mortality is observed to occur with a diminishing mean annual temperature and rainfall.

The extreme rarity of cancer among primitive races, such as the North American Indian, and the relative infrequency of special forms of cancer among certain types of mankind, such as the comparative freedom from cancer of the breast of Japanese women, are brought forward as proof that even a very low cancer death rate is not necessarily evidence of the intrinsic untrustworthiness of the returns.

With regard to heredity and family history, some additional observations re-emphasize earlier conclusions that the available evidence in this respect is in the negative.

The available evidence as regards a possible parasitical origin of cancer is held to be inconclusive.

Reviewing the aggregate results of the present investigation it is shown that cancer is much more common than has generally been assumed to be the case; that the

mortality from the disease throughout the civilized world exceeds 500,000 per annum, and in the United States about 80,000 at the present time; that the disease is increasing in practically all civilized countries and as a general rule in all its principal forms or varieties, and that it is therefore strictly within the limits of scientific conjecture that a further rise in the death rate may be anticipated, unless the disease is made subject to more effective methods of treatment and control.

**A combination of charity and business** is noted in a recent newspaper advertisement in the Pittsburgh papers. The May Drug Company which maintains a chain of drug stores in Pittsburgh, includes in their usual advertising the following most unusual announcement:

"It has been our custom for a number of years to fill prescriptions free of charge for those worthy of help who are sent to our stores by an authorized charitable institution. Recently it was pointed out to us by the head of one of these institutions that the scope of this service would be made broader by making this fact better known.

"Any reputable physician is authorized to send any worthy poor person to our main store for prescriptions, and we agree to fill them without cost. Nothing is required but a note from the physician on his professional card or prescription blank, that the patient is entitled to the assistance.

"In this manner we aim to contribute our share to the public good, instead of paying out an even small amount in the countless requests for contributions to programs, fairs, bazaars, among which we cannot discriminate."

We compliment the directors of the May Drug Company for taking a step which cannot but have a beneficial effect, both upon those who profit by this well-placed charity and upon that most valuable but intangible asset of any business—good will.

It would seem that certain of our large New York retail drug corporations might better adopt some plan similar to the above instead of conducting one-cent sales. Surely they would do an infinitely greater amount of good, and probably secure a good deal more effective advertising at far less cost.



**Vaccines and Whooping Cough.**—Paul Lublinger (*New York Med. Jour.*, May 22, 1915) concludes his paper as follows:

1. Pertussis stock vaccines as prepared by the Bureau of Laboratories seem to have a prophylactic value when given in high doses.

2. In the treatment of pertussis, these vaccines seem to have shortened the duration and severity of the paroxysmal stage; the average duration of the whoop being twenty-five days, compared to forty days of those treated with drugs.

3. Further experiments with the view of obtaining more effective vaccines and a closer cooperation of the profession in public health education, may help in the eradication of pertussis, this scourge of childhood which kills yearly ten thousand American children.

**"Twilight Sleep" Unsatisfactory.**—"At the present moment it is unquestionably true that the medical profession is not convinced of the safety of 'twilight sleep,'" says an editorial writer in the *Lancet* (Sept. 30, 1916), "and does not admit that its advocates in the profession have proved their case. Probably the pronouncement in Latham and English's System of Treatment sums up current teaching accurately. In this work Dr. Llewelyn Powell states that certain special circumstances may render scopolamine and morphine justifiable and advisable treatment, but he condemns it as a routine method. In this connection it is important not to overlook the fact that success with any newly introduced treatment is far more apt to be reported than failure. It is possibly true that the critics and opponents of 'twilight sleep' have not been more numerous in recent medical literature in this country than its supporters; but inquiry amongst those who have tried the

methods on any large scale in maternity institutions reveals a degree of dissatisfaction very much greater than a summary of published cases would indicate."

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**The Obligation of the Hospital to Its Internes.**—To demand a year or more of time of a young man just leaving the medical schools after having undergone all the sacrifices necessary to his medical education is a serious matter, Baldy well states (*Jour. A. M. A.*, Aug. 19, 1916), especially when we consider the age at which the average medical student leaves the medical school. Consequently when the state demands an internship of a period of time in a hospital, it is bound to see that the hospital providing this internship is capable of returning to the interne a competent *quid pro quo* for his time and his sacrifice. This means the standardization of hospitals, just as medical schools have been standardized and are still in process of being standardized.

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**The Lessened Fertility of Women, Especially in America.**—“The study now being made in certain countries,” writes Stone (*Am. Jour. of Obstetrics*, Sept., 1916) “including our own, of the infertility of women, will throw light upon the various means of limiting the birth rate. That such practices have greatly reduced the birth rate in the United States, especially among native women, is admitted by nearly everyone with interest enough in the subject to read available literature. That selfishness, luxury, and perhaps erratic philosophy, are largely responsible for this condition of affairs seems to us beyond question.”

It is impossible to give a connected statement of results of studies of this question which have been made in the more civilized countries. The number of children born has been tabulated in several countries, but until within a comparatively short time no analysis has been attempted. France made the first definite effort to probe the subject from 1900 to 1906, and this country since that time has developed some features of our 1910 census which, however inadequate, give promise of more reliable and extensive work in the future.

It has been shown by these studies that our native population is fast approaching a standstill; that we are depending upon immigration to populate our vast estate, and that our native women are not willing to give birth to such large numbers of children as did their parents or grandparents. The decline of the birth rate in the United States among native women is now comparable to that of France, where the birth rate exceeds the death rate only by a narrow margin. The population of France a century ago exceeded that of Germany, and in the time of Louis XIV that country had 35 per cent. of the entire population of Europe. Now she has only 13 per cent., and a population of 40,000,000 to Germany's 65,000,000. Another striking fact is apparent in view of our assimilation of the various elements of foreign peoples who come hither, namely, the decline in their fertility. Foreign women of the poorer classes as a rule are fruitful. There is only one in twenty infertile in such portions of this country where statistics have been carefully kept and studied. Alongside of these are our native white women, of whom one in eight is childless. The result of residence in America is shown in the second generation of immigrants, for the fertility is reduced to 5.3 per cent. from 6.5 per cent. There are 13.1 per cent. of our native women, both parents having been born in America, who are infertile. Certain European peoples, for instance the Poles, who come to this country, have 6.2 as the average number of children in each family. The average in French Canadian families is 5.6 per cent., while in native American families there are two or three children.”

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**Helping the Backward Child Forward.**—“Against stupidity the gods themselves struggle in vain.” So said the poet Schiller; but had he lived to this day, he would have revised his assertion in the light of present achievements says F. W. Barrows, M. D. (*The Nurse*, Nov., 1916). Our level-headed reformers are not struggling against stupidity, as of old. They are beginning to do things *for—not against—the backward child*, and they are seeing the fruits of their labors in many a restoration. It would double the length of this article to enumerate the lines along which this new move-

ment is working, but the whole thing can be summed up in a few words.

We are studying the backward child, as never before, to find the definite cause of his retardation.

We are adapting the treatment of the child to his particular weakness in order to cure him, instead of "making the punishment fit the crime."

We are training the child in habits of success instead of habits of failure and discouragement, and we are guiding him in the choice of a reasonable vocation so that his success may be continuous.

We are only beginning on these lines, but as we progress we are trying at the same time to make this world a better world to live in, especially for children, so that there shall be fewer backward children in the future.

We are doing these things because we want to give the child a chance and we realize that no child is either backward or bad through his own fault. The fault is ours, and James Whitcomb Riley was right when he said:

"The goodest mens they aint as good  
As baddest little child's!"

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**Marriage and the Growing Custom of Seeking Medical Sanction.**—"In former years, nobody thought," says Robinson (*American Journal of Clin. Medicine*, Oct., 1916) "of asking a physician for permission to get married. He was not consulted in the matter at all. The parents would investigate the young man's social standing, his ability to make a living, his habits perhaps, whether he was a drinking man or not, but to ask the physician's expert advice—why, as said, nobody thought of it. And how much sorrow and unhappiness, how many tragedies the doctor could have averted, if he had been asked in time! Fortunately, in the last few years, a great change has taken place in this respect. It is now a very common occurrence for the intelligent layman and laywoman, imbued with a sense of responsibility for the welfare of their presumptive future offspring and actuated, perhaps, also by some fear of infection, to consult a physician as to the advisability of

the marriage, leaving it to him to make the decision and abiding by that decision.

As a matter of fact, as often is the case, the pendulum now is in danger of swinging to the other extreme; for a little knowledge is a dangerous thing, and the tendency of the layman is to exaggerate matters and to take things in an absolute instead of in a relative manner. As a result, many laymen and laywomen nowadays insist upon a thorough examination of their own person and the person of their future partner, when there is nothing the matter with either. Still, this is a minor evil, and it is better to be too careful than not careful enough."

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#### **What Constitutes a Hygienic Diet—**

"The rudimentary principles of a hygienic diet are very few and very simple. They may be briefly summed up," according to Gibson (*The Medical Standard*, Oct., 1916) "in the avoidance of certain physiologically intolerable combinations, such as acids with starches, milk with proteids, meat and carbohydrates—or in other words; fruit with any form of food; meat with milk, fruit or cereals; free sugar in any man-made combination, acids with meals,—and in general avoid any product not grown on a tree or attached to a root. 'What God has united shall man not separate,' is a principle applicable not only to matrimonial relations but to every relation in which man stands to creative life.

"The above mixtures, whether applied to the lean or to the fleshy, to the neurasthenic or splenetic, to the sick or to the well—are antagonistic to their very nature, and tolerable only to the extent the indulging individual has reserve forces by which to subdue the inevitable fermentations. Immunity to poisonous mixtures is in appearance only. For while a person may possess sufficient nerve strength to defy the immediate effect of a poison, the indulgence is marked by deeper but masked changes, due to the losses sustained by the system in the neutralization and elimination of the offensive products. The gradual sinking of the vital column in the barometer of life, as registered by present vital statistics, shows unmistakably that the individual is indulging in dietary errors that foreshortens his natural span of life."



## THE VITAMINES, THEIR CHEMICAL NATURE, THEIR IMPORTANCE IN METABOLISM AND THEIR FUNCTION IN THE ANIMAL ORGANISM.

BY

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The term vitamines was introduced by the writer in 1912<sup>1</sup> to designate certain organic bases, the importance of which were recognized as the result of experimental studies on beriberi. It was demonstrated that the etiology of this peculiar disease was associated with the lack of the above substances in foods, which had been deprived of the important elements contained in the outer layer or husk of the grain of cereals by too extensive milling, or by the consumption of a diet subjected either to prolonged heating, or heating under pressure.

The name vitamines has been applied to these substances for two reasons. In the first instance they were undoubtedly proven to be indispensable to life. It is not exactly known what their physiological function is, but the assertion that they are indispensable is an indisputable fact. In the second place they belong to the class of organic bases exhibiting certain specific chemical characters which will be described in the course of this paper. It must be ad-

mitted that a great many criticisms have been levelled against the use of the term vitamine. The most important of these is that other constituents of diet as well as vitamines are equally essential to the maintenance of life. This is without doubt true, but the term was introduced chiefly for the purpose of emphasizing the importance of these particular elements of diet which had been hitherto overlooked entirely. This purpose has been fulfilled. A better plea cannot be brought forward in support of the appellation vitamine, than by referring to the well known fact, that an animal is able to live longer when food is withheld altogether, than when all the known constituents of a diet, with the exception of the vitamines, are supplied to it.

A further justification of the name can be found by a comparison of the amount of literature on the subject before and after its introduction. While no especial importance perhaps, can be attached to a name, it must be admitted, however, one well chosen has the power of stimulating research in a particular direction. A problem previously obscure comes suddenly into prominence, and it must be allowed that in this case for example, the introduction of an appropriate and somewhat striking nomenclature has brought about the desired result.

Moreover, every new paper dealing with the subject from the chemical standpoint

gives more support to our claims as will be gathered from a perusal of the paper.

Before the writer entered the fields of experimental research on deficiency diseases it was already known, thanks to the classical work of Eykman, Gyns and Schaumann that rice polishings and yeast contain a substance which is curative for beriberi, as it was also known that fruit juices possess marked antiscorbutic properties. It was not known, however, whether or not we were dealing with a product of a ferment nature, nor in which class of chemical bodies these interesting substances could be classified. One other fact known there was that the active substance could be extracted by means of alcohol.

Before attempting any further chemical work, it was thought to be extremely important to determine whether the active product was a complicated product of a protein or phosphatide nature; this latter view being still held to a certain extent by Schaumann.<sup>2</sup> This object was accomplished by subjecting yeast to the hydrolyzing action of 20% sulphuric acid for twenty-four hours. It is known that this concentration of acid acting for the above mentioned length of time hydrolyzes all the ascertained existing complex products, as for instance, proteins, polysaccharids, nucleic acids and lipoids. The work done in conjunction with my late collaborator Cooper<sup>3</sup> showed that yeast treated in this way possesses very nearly the full action of the original yeast. At the same time, this gave a hint as to future procedure and led to the introduction of autolyzed yeast as a curative agent by Cooper.<sup>4</sup> The remarkable stability of the product in acid solution justified the presumption that it was a nitrogenous organic base, and methods were used for indentifying such

substances. By employing pigeons fed on rice as reagents, an extract of rice polishings was fractionated by phospho-tungstic acid, then by mercuric chloride and silver nitrate alone, and in alkaline solution. It was found that the active substance is constantly present in the pyrimidine fraction, which fact does not prove, as will be seen, that the active product really belongs to the above chemical group. From this fraction, a crystalline, chemically pure substance was isolated in minute quantities which possessed a certain amount of curative action.<sup>5</sup> To Suzuki, Shimamura and Odake<sup>6</sup> should be given the credit of having recognized this substance as nicotinic acid. A finding which may have some bearing on the elucidation of the chemical nature of vitamines. By employing a modification of my method Moore and his collaborators<sup>7</sup> attempted to isolate the active principle but their technic was undoubtedly faulty. The author has extended his method to the investigation of yeast, and the material first used was an alcoholic extract of dried yeast, previously hydrolyzed with sulphuric acid. In this instance as in the case of rice polishings, a substance was isolated from the curative pyrimidine fraction, which on further attempts was repeatedly found and which indeed can be isolated without any difficulty by carefully following my methods.<sup>8</sup> It has been noticed that the curative power of this substance loses its activity more and more with each subsequent purification and at the present time it is impossible to state whether the product was really the vitamine which had lost its power by intra-molecular changes, or whether we were dealing with an inactive substance, in which a trace of the active body had been admixed or absorbed. By further work<sup>9</sup> the curative fraction was separated into three

substances, and evidence was thereby afforded that the original material was more complicated still in its composition. All the three substances were analysed, but in the article it will be sufficient to state that one of the products was nicotinic acid and that the other two seemed to be condensation products of the same acid. I had further evidence that nicotinic acid was also present in the curative fractions obtained from milk and brain.

In general terms it may be said that in the isolation of vitamines, similar experimental difficulties are being met as were encountered in our chemical studies dealing with products of internal secretion. It may be safely said that, in spite of claims to the contrary, up to the time this article was written, we have been unable to isolate any of these products with any degree of certainty. This statement applies with equal force to pituitary gland, thyroid gland, the suprarenals (thus adrenalin is not in reality the important product of these glands, as the supply of this base to an animal deprived of suprarenals is unable to save its life), thymus, sexual organs and so forth. It seems possible that the elucidation of the chemical nature of vitamines or of any of the above mentioned products may aid in the solution of a whole group of problems and therefore will initiate a new chapter of biological chemistry of the highest significance. The successful isolation of any of these bodies will provide a general method for dealing with chemical products of this unstable character.

It may be stated here that in a broad way the results of these experimental researches on the vitamines have been confirmed by Schaumann<sup>2</sup> and by Chamberlain, Vedder and Williams<sup>10</sup> and by Voegtlin and Sullivan,<sup>11</sup> and I shall now proceed

to review recent progress made in the chemical studies on vitamines.

It has been observed by the present writer (see Drummond and Funk<sup>12</sup> and Funk<sup>13</sup>) that by beginning with an alcoholic extract of dried yeast and by treating the phosphotungstic precipitate obtained with acetone, the bulk of the precipitate is dissolved, leaving a small residue which was found to contain the bulk of the vitamine. This residue when decomposed with neutral lead acetate instead of the alkaline barium hydroxide proved to be the most active fraction obtained so far. Autolyzed yeast, however, when subjected to the same method does not yield the same results.

A very important advance in the chemistry of vitamines was made by Seidell<sup>14</sup> by the introduction of a patented colloidal hydrated aluminium silicate preparation, known as Lloyd's reagent, for the separation of vitamine from autolyzed yeast. I took up the matter myself and am able to fully confirm Seidell's results. I have also found that other colloidal silica preparations are not effective and that the amount of precipitate obtained by means of Lloyd's reagent is so large that it must contain a large quantity of impurities. The form of the administration of the preparation is that of the original aluminium precipitate.

Advance has been also made in another direction. The writer<sup>15</sup> found some time ago that certain derivatives of nucleic acids possess a distinct curative action on beriberi pigeons. It was likewise found that nicotinic acid had a beneficial effect, but the effect was not obtained uniformly. The explanation of this apparently contradictory action may perhaps be discovered in a very interesting contribution by Williams.<sup>16</sup> He studied the curative effects of certain synthetic hydroxy-pyridin derivatives, and it

was found for instance, that 6-hydroxy-pyridin can be obtained in two and perhaps in three different crystalline forms, one in the form of needles and one in that of granules. The needle form is curative for five to six days and the granular form was found to be without action. In this case it might be a question of enol and keto tautomerism, and while the strange behavior would not explain certain contradictory results obtained with one and the same pure product, it supplies fresh proof of the correctness of my assertions and in addition may indicate why vitamine is so unstable when isolated.

Recently Williams and Seidell<sup>17</sup> have investigated chemically the precipitate which is formed from autolyzed yeast by means of Lloyd's reagent. As an acid extraction gave a large amount of soluble aluminium salts, an extraction with an alkali was attempted, and a substance was isolated which was found curative for beriberi pigeons, but which was unable to keep these animals at the same weight when polished rice was given as the sole food. On purification of this substance adenine was obtained, a substance which has been already isolated from yeast by the writer, and found inactive. These authors suggest that vitamine is nothing else than an isomer of adenine. As, however, vitamine was constantly found by the author in the fraction of adenine filtrate (the curative fraction being separated quantitatively from adenine either by silver nitrate or by picric acid) the data obtained by Williams and Seidell requires a fuller confirmation.

The chemical investigation of the vitamines is undoubtedly in the right direction and far reaching results may be anticipated in the near future.

With regard to the physiology of the

vitamines, we are unable to explain at present, why these substances are so indispensable to the animal organism, but certain facts in this connection which have been gathered so far must be mentioned. First, the writer<sup>18</sup> found that animals fed on white rice showed very marked changes in the chemical composition of the brain. This finding is possibly important, as the most characteristic feature of deficiency diseases is a group of symptoms arising from the central nervous system. It is possible that these changes are in part due to the half starved condition of the animals. Recently Koch and Voegtlin<sup>19</sup> were able to confirm these results on a series of different animals, as well as on post mortem material obtained from pellagra patients.

Another important fact which was discovered a short time ago is that a definite relationship exists between the onset of certain deficiency diseases and the amount of carbohydrates consumed. This fact, worked out first by the writer of the present resume,<sup>20</sup> has since been corroborated by Braddon and Cooper.<sup>21</sup> It was already known for some time to those who had studied beriberi from the clinical standpoint that with an increase in the consumption of polished rice, the onset of the disease can be hastened. This has been attributed to the presence of toxic substances in the rice and was formerly the accepted explanation of the acceleration of an outbreak. It was also known that deficiency diseases in childhood occur when proprietary foods consisting chiefly of starch, make up the bulk of the dietary. By actual experiments on animals, I was able to ascertain that by decreasing or increasing the quantity of polished rice or even of pure starch, beriberi can be produced slowly or quickly as desired. It has also been found that in beriberi the blood

sugar is increased very markedly, especially in those cases in which large percentages of starch were given in the diet. Occasionally in the literature on the subject clinical data may be found referring to the increase of blood sugar in certain deficiency diseases as in scurvy but the matter has not been dealt with systematically, and no data can be found relating to blood sugar in acute beriberi or pellagra occurring in man. It, however, is certain that there is a very definite relationship between the vitamine present in the food and the amount of carbohydrates which have to undergo metabolism. Accordingly, the fact must be emphasized that a certain amount of vitamine can take care only of a limited amount of carbohydrates.

With respect to the influence of vitamines on metabolism some important facts are known. Although the measure of their importance on metabolism is at present obscure, actual experiments have demonstrated that in the absence or deficiency of vitamines the entire metabolism of organic and inorganic constituents goes wrong. Up to a recent date scarcely any of the investigators in this field have taken this factor into account and in looking up the modern literature on the subject one may notice instances where the neglect of the important factor has led to erroneous conclusions. For example, this statement applies to the phosphorus and calcium metabolism. Usually two diets, one rich and the other poor in these inorganic constituents, are compared without taking the vitamine content of the two diets into consideration. In the same way this applies to a study of protein minimum and the necessity for certain amino acids.

After thus summarizing the latest developments of researches on vitamines, it will be fitting to briefly outline the out-

look and plans in this direction for the very near future. The most important problem to be solved in order to fully elucidate the whole question of the vitamines is their thorough chemical investigation. In this lies the crux of the matter and when this has been overcome the rest of the course should be fairly easy sailing. But that the chemical investigation may be thorough and searching improvements are called for in methods of isolation. I wish to lay particular emphasis on the point that the chemical constitution of the vitamines must be determined with accuracy ere absolutely definite statements on the subject can be made. Thus it must be ascertained if the vitamines in different foodstuffs possess the same chemical structure, and further if all the supposed vitamines belong to the same chemical class of substances. Another problem which awaits solution is with regard to the normal function of vitamines in the animal body. And hand in hand with this problem the mechanism of the onset of deficiency diseases must be considered. It has been suggested by a number of investigators that food contains some mysterious elements possessing important physiological functions. This role was usually ascribed to lipoids and phosphatides, as very little was known concerning their chemical structure or their purification. Soon, however, it was shown that purified substances of the above class were devoid of any physiological action and it may be assumed now with a good deal of certainty that their alleged physiological action must be attributed to the casual admixture with vitamines which happen to be soluble in the same solvents as lipoids. Views as to the importance of lipoids are so deeply imbedded in the minds of investigators and students that the shift-

ing of the center of gravity from lipoids to vitamines will take place but gradually.

It is my firm conviction that although this movement is slow, it is steady and progressive, and that as knowledge of vitamines increases it will gather momentum until finally it will sweep all barriers away and all will be made clear. In my opinion the time will not be long ere this ultimate result will be reached, and the true role of vitamines fully determined.

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## SOME GENERAL ASPECTS OF THE "VITAMINE" PROBLEM.

BY

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When in 1911 Funk described a method for obtaining an ash-free nitrogenous substance from rice polishings which was highly curative for avian beriberi, the discovery was hailed as the culmination of years of arduous work by those who had adhered to the dietary theory of the etiology of the disease. Eijkman, Pol, Fraser and Stanton, Chamberlain and Vedder, and others found in it strong vindication of their earlier contentions. After some further experimental work had been done, Funk's book on the "vitamines" appeared, a work which had a tremendous stimulative effect upon research in this field.

Indeed at that time it was felt in many quarters that the problems of the nutritional disorders had been reduced to relatively simple terms. But great as has been the value of our practical understanding of the etiology of beriberi, it must be confessed that the contributions to dietary deficiencies which have been made in large volume during the past three years have not been such as to impress one with the simplicity of the subject as a whole, or the adequacy of our present conceptions. In fact our knowledge appears to be more confused and the ultimate solution more distant and obscure than it did three years ago. Among the discouraging developments has been Funk's failure to isolate the physiologically active substance in a state of chemical purity. Further, although Funk's conjecture regarding the dietary origin of pellagra has received strong confirmation, particularly in the work of Gold-

berger, an intimate relation between beriberi and pellagra is not yet established. Studies of growth substances by Hopkins, Osborne and Mendel, T. B. Robertson, McCollum and his co-workers have clearly shown the existence of such minor constituents of both vegetable and animal tissue, but what their relation, if any, to Funk's "vitamines" may be does not yet appear. McCollum has adduced evidence tending to show that other factors than the presence of "vitamines" have an important bearing on the development of beriberi-like symptoms in animals and that the several known factors have a certain degree of interdependence. Finally, a recent paper by Funk calls in question the accepted interpretation of the etiology of the scorbutic symptoms produced in guinea pigs fed on whole ripe grains.

Funk's idea was that the pathological conditions of scurvy and beriberi, which together with other affections he grouped under the term "deficiency diseases," are due to the absence from the food of a "vitamine," which in each case is specific for that disease. In accordance with this theory there was a temptation to presume that the "vitamines" entered into the composition of tissues and that the need for each of the several "vitamines" was more or less localized in certain tissues. Thus the idea has been expressed that the beriberi "vitamine" was most essential to peripheral nerve tissue and accordingly its absence resulted in marked selective degeneration. In the opinion of the writer present evidence has made such a view untenable. Experience has led me to believe, first, that the "vitamines" are not specific in their action but indirect and general; second, that while "vitamines" are necessary to animal life the presence of an abundance of them in the food is not an ab-

solute insurance against the so-called "deficiency diseases"; third, that their function is to oppose in some manner the unknown but widely, if not universally, operative force or forces which are the true causes of the "deficiency" symptoms; fourth, that the "vitamines" are able to offset these forces with varying degrees of completeness depending on many factors. Without minimizing the importance of the vast mass of evidence showing that oriental beriberi in a practical sense is caused by a deficient diet and that the "vitamine" of rice polishings is an effective protective and curative agent for the disease as it commonly exists, one must take account of our ignorance concerning "vitamines." As long as there is no certain knowledge regarding their physiological action, the specific deficiency idea remains a habit of thought rather than a well founded theory.

#### CLINICAL AND PATHOLOGICAL EVIDENCE ON NON-SPECIFICITY.

Beriberi, pellagra, and scurvy are diseases which in most cases are fairly readily distinguishable from one another. On the other hand there are many cases in which some symptoms of any two or all three diseases appear together. Furthermore, if foods which are generally believed to be productive of any one of these several human diseases are given to fowls as their exclusive diet, they have so far been found to produce only one disease, a multiple neuritis most closely resembling human beriberi. Little and others have shown that white wheat flour produces human beriberi and yet white wheat flour and fat pork are regarded as typical producers of scurvy. Further, although pigeons will maintain full weight and apparent health on whole oats or wheat, guinea

pigs and rabbits develop a scorbutic condition and die. Moreover, McCollum and his co-workers have shown that in contrast to fowls, swine fed on whole wheat develop beriberi-like symptoms which cannot be corrected by the addition of what have been regarded efficient anti-beriberic food stuffs. Moore has described a high incidence of a beriberi-like disease among swine fed largely on rice polish and with much reason has attributed the disease to the diet. If he is correct we are faced with the fact that the very material which has been most successfully used as a prophylactic against human beriberi in the Orient is the cause of beriberi in swine in Canada. Rommel and Vedder have also called attention to the close resemblance in pathology between cotton-seed poisoning in swine and human beriberi. Furthermore, it has been amply shown that the tissues of animals fed on foods containing unusually large proportions of certain mineral constituents may possess sub-normal contents of the same elements, showing that the composition of the tissues is by no means so directly affected by the composition of the food as one might suppose.

That a specific deficiency is not the direct and immediate cause of beriberi either human or avian is further evidenced by the rapidity with which the acute stages of the disease are reached and the promptness with which the severe symptoms may be relieved. In both fowls and human beings there may be a transition within a few hours from a condition of a comparatively mild malaise into the severest paralytic attacks with rapidly ensuing death. Proper treatment frequently brings about as marked and rapid a change in the opposite direction. A starved animal does not suddenly succumb, nor does it immediately revive

when fed. Therefore, beriberi presumably is not purely a specific starvation.

The clinical and pathological evidence above cited appears to show an intimate relation among these diseases. On the other hand each is developed under conditions sufficiently diverse to throw doubt on the specificity of the deficiency in each case.

#### CHEMICAL EVIDENCE AGAINST SPECIFICITY.

These facts are supported by an entirely independent set of observations on the curative action of substances of synthetic origin upon polyneuritic fowls. A digression will be necessary to summarize these findings which for the most part are of recent date.

It has been found possible to effect substantial relief of the paralysis of polyneuritic pigeons with a number of compounds of very diverse composition. This series includes seven mono and poly-hydroxy pyridines, nicotinic acid, betaine, and, as previously shown by Funk, various purine and pyrimidine compounds. A substance may therefore be a pyridine, purine, hydantoin, pyrimidine, or alipathic derivative and still produce marked and apparently essentially identical effects on polyneuritis. It may consist of carbon hydrogen and nitrogen or it may include oxygen as well. It may contain a potential phenolic, alcoholic or carboxylic hydroxyl or an amino group. In fact it would be difficult to imagine a series of compounds of greater diversity which would still possess any chemical resemblance whatever to one another.

And yet there appear to be certain points of resemblance in external deportment and we believe in chemical structure as well. In all of these substances which have been carefully studied the physiological properties are evanescent and automatically dis-

pear when the compounds are kept a few minutes, days or weeks, as the case may be, in a solid state or in pure water solutions. In some cases the loss of curative power in the solid state is attended by striking changes of crystal form. Thus  $\alpha$ -hydroxy pyridine, the most studied member of the series, may be caused to crystallize in the form of slender needles. Injections of these crystals in the form of freshly prepared water solutions in doses of one milligram or even less in numerous cases have been followed by the restoration of a completely paralyzed polyneuritic pigeon to a state of approximately normal activity within the space of a few hours. These needle crystals, even when kept dry, granulate in the course of a few days and when the process is complete no longer show a trace of curative action. The change of crystal form proceeds more rapidly when the needles are submerged in a mixture of benzene and ligroin or are moistened with a small amount of almost any solvent. The loss of physiological properties also takes place in water solution, rapidly at higher temperatures, slowly under ordinary conditions. Yet a water solution of the substance which after standing a week or more has lost all physiological activity may be evaporated to dryness and the residue recovered in an active form by allowing crystallization to take place at about 70-90°. The dry curative form is the more stable at that temperature; the non-curative at ordinary temperatures. Though the process of crystallization is somewhat difficult to control, the transition in either direction can be accomplished by the simplest of means.

The change from needle to granular crystals bears many points of outward resemblance to what has been called the "tin disease," a transformation of the ordinary bright malleable metal into a gray powder

which takes place when tin is exposed to temperatures below 20° for long periods. Just as in the case of tin the transformation proceeds from points of inoculation of the meta-stable with stable form of the metal, so in a mass of needle crystals of  $\alpha$ -hydroxy granulation progresses from foci of contamination with crystals of the permanently stable form.

In the case of the hydroxy pyridines it has been possible to prove with reasonable certainty that this change is due to isomerization; i. e., to a rearrangement of the certain atoms in the molecule without disruption of the molecule as a whole or what amounts to an alteration of the architecture of the molecule without any change in the number or kind of units of building material. The structure of the curative form of  $\alpha$ -hydroxy pyridine can be represented by formula I while that of the non-curative form is probably best pictured in II. (See p. 760).

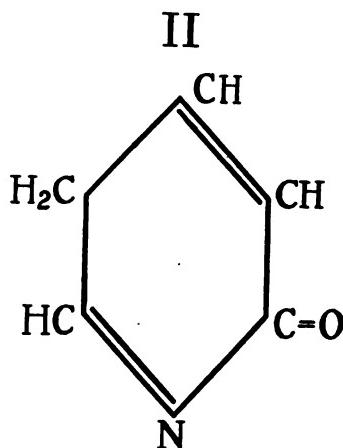
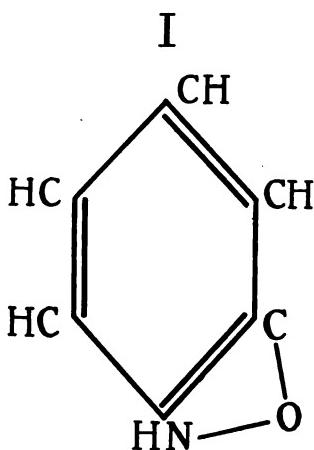
In the case of most of the compounds found to be more or less antineuritic the structure has not been proven. However, all of the compounds with the exception of betaine contain a labile hydrogen atom and one or more basic nitrogen atoms. Further, all of them, without exception are theoretically capable of forming a betaine like ring in which a carbon atom is joined to a pentavalent nitrogen atom through an oxygen atom (see formula I) or through an imide group. Evidences of such a structure have been traced through a series of otherwise diverse molecules and in numerous cases the writer has been able to predict antineuritic properties, to his own satisfaction at least, solely on a consideration of these evidences.

But since a more or less stable structure of this type is theoretically possible in most

nitrogenous constituents of animal tissue, it does not assist us greatly in fixing the identity of the compounds or complexes which function as "vitamines" in our foods.

To return now to our main theme of the specificity of the "vitamines," it may be said that the above substances so far as they have been studied appear to be practically interchangeable as far as their immediate effects on polyneuritis are concerned. Attention has already been called to the chemical diversity of the series. To imagine a multiplicity of series of approximately equal diversity would exhaust our chemical dictionaries of all compounds even remotely related to each other. And we must imagine that the several

of a substance *per se*. For if the animal merely requires one of two readily interconvertible isomers, why should its needs fail to be met sooner or later by supplying either one of the two? Further, all of the antineuritic substances we know anything about, whether natural or artificial, are unstable. That such an instability is inseparable from antineuritic properties becomes increasingly probable as the series is extended. The transformation of a meta-stable modification of a substance into a stable one as far as our experience goes is always attended by a liberation of free chemical energy. It is conceivable that this free energy, though small in amount, has something to



hypothetical specific "vitamines" have some relation to one another. That there are many "vitamines" in nature seems wholly probable, but that the absence of any one from a diet will produce a specific pathological condition seems utterly unlikely from present chemical evidence.

The fact that the inactive modifications of the substances are all readily convertible into the corresponding active ones and are still without either curative or protective properties affords further evidence that the deficiency in polyneuritis is not a deficiency

do with the physiological action. At all events, this evidence does not support the view that the "vitamines" function as essential tissue constituents.

#### POSSIBLE NATURE OF THE ACTIVE AGENTS OF DIETARY DISEASES.

But if it be granted that the function of the "vitamines" is not that of building stones of tissues, we must formulate some other conjecture. It is noteworthy that the effect of "vitamines" is systemic rather than symptomatic and that minute quantities pro-

duce relatively great results. This latter fact suggests an action of a catalytic type, that is to say that the "vitamines" facilitate some process or processes without themselves being exhausted in chemically equivalent quantities. Somewhat in accordance with this view Funk and later Braddon and Cooper suggested a hormone-like action and recorded evidence to show that "vitamines" are especially concerned with carbohydrate metabolism. However, their evidence is not above criticism, and the conclusion, if correct, is not very informative, since we know that a virtually carbohydrate free diet may produce polyneuritis nearly if not quite as rapidly as one rich in carbohydrates. On the other hand we are led to believe that an increased general metabolism increases the "vitamine" requirement. Arduous physical labor is credited with hastening the onset of beriberi. Further, it is common knowledge that the incidence of both beriberi and pellagra is exceptionally high in women during the periods of gestation and lactation.

If, as suggested above, a deficiency of "vitamines" is not the active causative agent of the so-called "deficiency diseases" we are confronted with the question of what these active causes may be. Here we find ourselves in the field of speculation, but plausible explanations of known facts can be found on this basis, which is more than can be said for the specific deficiency theory. The causative agents of the several "dietary" diseases may be microorganisms capable of growth and development only in poorly nourished hosts. The probability that this is the case is greatly diminished by the record of numerous failures to transmit pellagra and beriberi or to isolate causative organisms.

Another possibility is that the several diseases are caused by toxic substances, in

some cases present preformed in food stuffs, but invariably elaborated in the body as by-products of metabolic processes. Such a suggestion regarding beriberi was made by Williams and Johnston largely on the basis of clinical and pathological findings. Since that time a number of further facts which strengthen this view have come to light, and the writer still regards it as the most promising line of attack, not only for beriberi but also for the other "deficiency diseases." The chief new facts are these: Rommel and Vedder have found that cottonseed poisoning in swine resembles human beriberi in a remarkable way. And yet there is a vast amount of evidence tending to show that cottonseed poisoning is due to a poison as the name would imply. McCollum, Simmonds and Pitz encountered facts which appear inexplicable except upon the assumption that wheat embryo contains a toxic substance, the effects of small amounts of which can be completely offset by suitable modification in the diet and at least partially by addition of "vitamines." Hart, Miller and McCollum in a continuation of this work showed that swine fed on grain mixtures in which wheat predominated (mixtures certainly rich in "vitamines") developed pathological conditions "analogous to, if not identical with," that "recorded for polyneuritis in fowls, but here induced by an inherent toxicity and not by a deficiency." That such pathological conditions in the last analysis could be produced by such dissimilar causes, appears to me unthinkable. It is more reasonable to suppose that they are always caused by a toxicity. The work of Moore above referred to also points in the same direction. Hunt, Salant, and others have also described experiments showing that diet has a marked effect on the toxicity of certain drugs.

But if toxic substances are always responsible for the "deficiency diseases," they must be present in all foods or be produced from them in the course of metabolic processes. That toxic compounds are present preformed in all foods is not probable, especially not in the case of artificially purified food stuffs, but that a series of related toxic substances should result in varying degree from the metabolic decomposition of all foods, whether fats, carbohydrates, or proteins, seems entirely believable. The presence of a common toxic element in all proteins as maintained by Vaughan is a case in point. However, the development of "deficiency" symptoms is not accelerated by high protein foods and occurs as a result of exclusive diets of practically protein free food stuffs. Moreover, if we consider the chemical nature of fats, carbohydrates and the non-nitrogenous residue of proteins we find that we are dealing with three series of related compounds consisting principally of rather long chains of carbon atoms which are for the most part saturated. That any or all these compounds in the course of oxidation in the body should give rise to mixtures containing greater or less amounts of related toxic substances, quantitative and qualitative variations of which would be capable of producing the various "deficiency" symptoms, is quite believable from a chemical standpoint. Further, there is no known obstacle to the formation of similar substances in plants. Very recently Hurtley and Trevan have described the physiological effect of aceto-acetic acid, acetyl-acetone, and other substances containing the group — CH = COH —. Such compounds according to these authors are strikingly similar in their action and produce phenomena resembling those of diabetic coma. Substances of this type are generally con-

ceded to be produced regularly in the normal body from both fats and proteins.

This idea of a general, non-specific, anti-toxic or eliminative action of the "vitamines" has not developed far enough to justify any great degree of faith in it. But whether or not it contains the germ of truth, the purpose of the writer will have been accomplished if our present ignorance of the nature and function of "vitamines" has been portrayed in its proper proportions and the uncertain footing of the specific deficiency theory has been exposed. Aside from the practical prevention and treatment of beriberi, our present knowledge has added little of definite value to the useful equipment of the medical profession, but the unquestionable proof of the importance of minor constituents of food makes us hopeful for the future.

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## SOME STUDIES IN THE DEFICIENCY DISEASES OF INFANCY AND CHILDHOOD; INTERRELATION, PROPHYLAXIS, AND MANAGEMENT.

BY

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Perhaps no group of abnormal conditions seen in infancy and childhood has been the subject of more extensive study and more divergence of opinion than that with which this paper deals. Rachitis, osteogenesis imperfecta, osteomalacia, infantile beriberi, scurvy and infantile pellagra will be regarded under the common head of the

deficiency diseases being, in the writer's opinion, more or less interrelated etiologically, possessing a striking similarity in symptomatology and responding, to a greater or lesser degree, to allied therapeutic measures.

Three important factors tend to show why infancy and childhood are particularly vulnerable to the deficiency phenomena of metabolism:

- (1). The uniformity of the infant's diet the greater part of the first year.
- (2). The slight variability of the diet even up to an age of two or three years.
- (3). The peculiar and not infrequent tendencies of older children to refuse certain important articles of food and to favor others less adapted to their requirements.

At first, up to the age of six or seven months, in many cases longer, an infant is fed exclusively on milk, either mother's or else a modification of other milk. Under normal conditions there is no doubt that mother's milk is the ideal baby's food, but in these days the force of circumstances or the numerous other factors, not ordinarily granted much deserved attention by the medical attendant, may so change the composition of the mother's milk that it ceases to be a complete food. This failure to be a complete food cannot be demonstrated in the laboratory by the ordinary chemical analysis of the known milk constituents, an analysis to which so much importance has been attached in the past. The field of animal experimentation is better suited to this work of definite demonstration. One need not go further than to observe the well known fact that, frequently, during pregnancy and lactation, mothers will desire and seem to subsist upon a diet which is badly chosen from the standpoint of our

recent knowledge of modern physiological standards. We are all ready to admit that frequently, these abnormal cravings are in the direction of articles of diet which have a very doubtful nutritional value and, from our standpoint, also very doubtful powers of maintaining a metabolic balance. May we not, therefore, analyze the congenital deficiency diseases, or those appearing soon after birth in breast fed babies, as deriving a causative factor from the deficient maternal diet just referred to? Veterinarians do not hesitate to admit it in their studies of similar conditions as they appear in animals under their care. There exists a congenital rachitis; of this the literature leaves us no doubt. This condition has been advanced as disproving the deficiency theory of rickets on the ground that, in this case, the diet of the child was not a factor to be considered; but, as a matter of fact, it is one of the strongest arguments in support of our belief. There is no lack of evidence that the maternal organism during pregnancy and lactation is in greater need, not only of the actual calorie-furnishing elements of the food taken, but also of those special substances, which Funk<sup>1</sup> has described and called "vitamines." This increase in all the nutrimental needs is out of all proportion to the increase in weight of the mother resulting from the increase of the developing ovum with its fetus, as well as out of all proportion, in the case of the nursing mother, to the increase of weight of the nursling. These facts, although fully described by competent observers, have been passed over lightly, but are now forced upon us in the light of recent investigations. At any rate, as far as the writer is aware, these important facts are not generally known by those who have developing and growing children in charge,

and, as a result, we have a deficiency in the metabolic requirements in many breast-fed infants, with scurvy or rachitis, or both, as frank manifestations, and "difficult feeding cases" with even less understood etiology as more occult manifestations. It is far easier to injure than to repair in the management of the progress of normal metabolism in the developing and growing baby, and if we fail to recognize causative factors we have very little else to thank but mere chance for any success we may have. The above facts are also in perfect agreement with the plentiful evidence that the deficiency diseases of later life, markedly osteomalacia, occur more frequently in the female and more especially during the child-bearing period. We can easily verify all these facts by the animal experiments which have been reported by many observers. Unusual physical exertion also requires not only additional calories but also additional vitamins, and, especially is this true, when unusual demands are made upon the powers of the carrying or nursing mother. Pigeons if forcibly exercised and plentifully fed on polished rice develop severe symptoms of beriberi, while controls, at rest, and on the same diet during the same period of time remain far less affected; in fact pigeons at rest may remain free from any discernible symptom of beriberi for an unusually long time even though fed on an exclusive diet of polished rice and then, if suddenly exercised, will develop all the symptoms of beriberi in a few moments. A similar observation as to the effect of exercise on human beings has been noted in districts where beriberi is prevalent.

Let us pass to the consideration of infants fed on artificially modified milk or else whole milk, typically cow's milk. We have

two points to consider up to the time when the child gets other foods. *Firstly*, when the milk is subjected to heating either by pasteurizing or by boiling, experiments have definitely shown that the active vitamine content is entirely dependent upon the time and degree of temperature reached. Investigations by Neumann,<sup>2</sup> Heubner<sup>3</sup> and others made many years ago showed conclusively that pasteurized milk when used as the sole article of diet produces infantile scurvy. The researches of these observers were disregarded for a number of years, in fact their results were questioned by some for a long time and until very recently. Today the same evidence which they brought forth, with the same conclusions are finding growing acceptance. The fact that orange-juice might be given as early as the first month with benefit was admitted by several observers years ago. Recent evidence tends to show that in over-heated milk the factor which disturbs the normal metabolic processes of the nursling is not a chemical change in the casein or other protein of the milk, as McCollum<sup>4</sup> believes, but is due, as has been proven by recent experiments in which the writer has been personally interested, to the inactivation of a definite substance in raw milk which prevents pigeons fed on polished rice from developing beriberi in the usual length of time. Undoubtedly a vitamine. *Secondly*, the vitamine content of cow's milk is by no means a constant factor and is not to be dealt with as such; it is entirely dependent upon the same, or at any rate, similar conditions among cows as has just been discussed in regard to nursing mothers. More particularly does this deserve our attention when we recall that, in the summer, the cows, or other milk giving animals, gain their supply of fresh food directly from

pasturage, while in the winter, the food has been subjected to drying, curing, storage, all tending toward inactivation of the vitamine content. The winter food, therefore, often provides just sufficient, or not infrequently too little vitamine for the metabolic processes of the animal to proceed normally, to say nothing of the vitamine deficiency of its milk. Self preservation is the first law of nature and the milk secretion which has more to do with the preservation of the species than with the preservation of the individual many times receives but little if any vitamine at all until the needs of the mother animal are satisfied. Actual epidemics of deficiency diseases among calves and then cows have been described by Lötsch<sup>6</sup> as occurring during the winters in the poorer districts of Saxon Switzerland. One can easily picture the state of health of children fed exclusively upon this milk, even though raw. No doubt if more attention were centered upon these facts, many cases of rachitis as well as some of the other deficiency diseases would find an etiology more definite than that with which they are at present dismissed.

As to the second fact, why infancy and childhood are particularly subject to the deficiency phenomena of metabolism after the child reaches the period when other articles of diet are offered, what do we find? Cereals, highly milled cereals, cooked interminably, to say nothing of the amount of starch solutions already forming the diluents of feeding formulas previously prescribed in most cases. Actual experiments upon rats fed with certain of the so-called baby-foods have proved beyond doubt that most of such preparations are not sufficient to maintain life, to say nothing of promoting growth, though they contain enough protein substances with all the "necessary amino-

acids" as laid down by Osborne and Mendel.<sup>8</sup> One may argue that the results obtained in rats may not apply to the human. Granting that, we still learn that *something* is missing in certain of these foods, a something which was probably destroyed in the process of its manufacture, since the test animals thrive very satisfactorily if they are fed with the raw materials from which most of these foods are made, or else if some adjuvant containing the missing substance is added to the "baby food." The "missing substance" is contained in fruit juice and yeast and both must be administered to make a complete food for the rat. In the added fact that babies fed on the above foods, exclusively, are the commonest victims of the deficiency diseases, especially rachitis and scurvy, we have the "evidence before the fact" as our barristers put it, for the writer's conclusions resulting from animal experiments. Now we know from the researches of Funk<sup>7</sup> and others that the foremost functions of the vitamines are to influence carbohydrate metabolism, especially that of the starches, and that, when this substance, or these substances, are not present in proportionate amount to the increased starch content of the dietary, the metabolism fails, its balance is destroyed and the patient suffers from the minor or major manifestations of disturbed nutrition or growth, entirely independent of the caloric value of his food intake or its inorganic constituents. Be it in its mildest form of so-called "difficult feeding case" or in the severest forms of rachitis, or even death, the cause is the same and the resulting condition simply a matter of degree. What is our problem, therefore? Either to diminish the quantity of carbohydrate, principally the starches, or else to supply substances such as fresh or very lightly

cooked vegetables, or certain extracts which are known to contain a marked excess of these essential substances. To do the former would mean a loss of calories to the child, to do the latter rarely fails to prove of decided benefit. It is held by many of our most prominent students of nutrition that excessive housing or other unfavorable hygienic conditions are prime factors in the production of deficiency disease, especially rachitis; this belief received a great impetus in the publications of Kassowitz<sup>8</sup> in which he put forth his famous "domestication theory" as an etiological factor of first importance in the production of deficiency disease in animals. Recklinghausen and others could not confirm his observations. Personal observations upon animals used by Funk in his experiments on nutrition showed them to be in far better condition than others living amid far better hygienic surroundings. They were nearly double the size of normal animals, gave no signs of deficiency disease and their offspring were far superior in vitality and growth to those born to animals living under normal conditions. We do not advance this as an argument against proper hygiene in the care of our babies, for we believe that, had our animals lived amid better hygienic surroundings in addition to their high vitamine diet, they would have done even better; what is really to be emphasized is the inadequacy of the theory of poor hygiene as the fundamental cause of the deficiency diseases. All of us have seen rickets amid the best hygienic surroundings and have failed to find it universal amid the very worst hygienic conditions. The same applies to all the other deficiency diseases. Other things being equal, however, hygiene undoubtedly plays its part in determining their progress and outcome, as it does in all other condi-

tions and diseases with which we are concerned in our daily work.

Lastly we have the problem of the child with its likes and dislikes toward certain articles of food and the degree to which those who have the child in charge cater to its wishes. Let us take as our examples the children between the ages of two and four years, for, after all, it is every man's experience that children affected, for instance, with rickets, show improvement before the expiration of that period. The explanation is simple if we remember that, about this time, the diet is very varied and includes many fresh foods such as juices, fruits, fresh vegetables and the like, which if not overcooked, are rich in active vitamines. These substances have, in such cases, again exerted their corrective influence, thereby bringing the metabolic standard up to its proper level. Many children, in spite of this, unfortunately are permitted an excess of foods rendered poor in active vitamine by overheating; add to this excessive carbohydrate to tickle the palate, crackers, bread, sweets *et cetera between meals*, or in excess *at meals*, and we have fertile soil for the development of one or the other of the deficiency diseases. As the origin of a "vicious circle" we find an idle effort made on the part of their attendants, perhaps under professional advice, to offset the evident substandard development of the child by the addition of more of the "foods" just given as examples, thereby not only spoiling their appetite for foods they should have, foods rich in active vitamines, but maintaining the very state of metabolic deficiency which they are attempting to combat. This furnishes us a reasonable explanation for the many cases of overfed weaklings and "substandards" that we see, and gives us at least a clue as to how to comfort the heart-

broken mother who gives her progeny "every care" and "the best of food" and yet fails to bring him up to the standard of the "neighbor's baby" who, by the way, "is not nearly so well taken care of." Cases of "persistent rickets" and osteomalacia give us no difficulties as to etiology, and many hints as to treatment, if we remember the facts just presented.

A most important fact to note in relation to this discussion is, that all of the deficiency diseases enumerated, as well as many allied conditions of similar origin overlap in their main symptoms. True, certain characteristic symptoms especially diagnostic of one or the other of the diseases just mentioned may stand out more prominently in that disease and so mislead one into the belief that no interrelation exists; but a careful study cannot fail to reveal an undeniable similarity of symptoms, taken as a whole, among apparently dissimilar conditions with correspondingly dissimilar names. All seem to find a common cause in some form of vitamine deficiency in the food. Furthermore, of paramount interest, is the fact that each, if studied by means of the metabolism-bed shows a negative balance of the inorganic salts such as calcium, magnesium, phosphorus and sulphur. It is not the purpose of this paper to go into the minute symptomatology of each of these conditions at this time, as this has been done many times by others and is sufficiently familiar to all, but it may be of service for the purposes of this paper to point out an overlapping of symptoms in the diseases under consideration. Hemorrhagic tendencies are most marked in scurvy, less marked in pellagra (though often present to such a degree as to present difficulties in differential diagnosis), frequently seen in beriberi, often seen in rickets and osteomalacia and have

been reported as occurring in cases of osteogenesis imperfecta. Gastrointestinal symptoms are very common in pellagra, very common in scurvy, always present in beriberi and very frequent in rickets. The nervous system is particularly vulnerable to all forms of deficiency disease. Whether it be a hyperirritability, a spasticity, a peripheral neuritis, a central neuritis, or the manifestations take the form of convulsions, of pain or of palsy, they are present to a greater or lesser degree in each and every one of this group of diseases. We need not individualize, but the most superficial comparison of the ordinary disturbances of the nervous system found in one, with those found in another, leave nothing lacking as far as similarity or analogy is concerned; whether the influence upon the nervous system be interpreted as direct or indirect it reverts to the metabolic deficiency as the basis of it all. Skin symptoms are common to all of these diseases either in the form of an eczema, an urticaria, a dermatitis or purpura, or a combination of two or more of these eruptions may appear at the same time, or in sequence. Obviously no marked improvement will appear in the eruptions until the metabolic deficiency at the bottom of it has been dietetically corrected. The ordinary practice of withdrawing fresh fruits from the diet of a rachitic with urticaria is, in the writer's belief, often the means of frustrating the cure. Perhaps, the successful practice of withdrawing or diminishing the sugar content in the diet of the eczematous child or one with spasm of some portion of the respiratory system with a rachitic basis, may find its explanation in the withdrawal of just so much carbohydrate as overwhelmed the amount of vitamine taken in the daily diet of the child; and, conversely, why autolyzed yeast

has been so successful in the writer's hands in intractable cases of this kind. Chronic or acute changes in the skeleton, especially in the long bones, are too well known and so generally apparent in all of the deficiency diseases that neither space nor time need be given to its discussion here. Blood changes ranging from a simple anemia of short duration to the very severest blood pictures lasting over long periods, perhaps throughout life, are common to all of the deficiency diseases depending upon their severity or duration. Changes in the ductless glands have been so marked in practically all of these diseases that reasonably enough, the gland disturbance has often been looked upon as the etiological factor in the disease in which it was affected. Perhaps it is the ductless gland upon which the unbalanced diet works its first havoc and then the abnormal secretion of the particular gland affected determines the nature of the deficiency disease which manifests itself. This is a matter for future research to decide. Vitamines may be substances out of which the ductless gland obtains some element necessary to the elaboration of its specific secretion. Lastly, and perhaps due to causes just cited as speculative, we find in all cases of deficiency disease of one type or another, more or less marked hindrances to the normal growth and development of the entire organism, the degree being dependent upon the duration and previous intelligent efforts made towards a cure. This, after all, is the most important factor to be considered in the care of this class of cases.

We must make certain not to confuse the true deficiency diseases with conditions due to a diet definitely lacking in the necessary inorganic salts; such a diet actually deprives manism of the materials to build with

and thereby produces a condition termed osteoporosis. Osteoporosis promptly disappears when these salts are administered in proper amount independent of any other addition to the diet. We have assumed in our discussion that the diet of the cases of deficiency disease which we see is sufficiently rich in these inorganic salts, but that, in spite of their presence in ample amount they are not retained and utilized by the little patient's economy. A true avitaminosis. Osteoporosis is not a true avitaminosis and should not be confused with rachitis nor osteomalacia. It is in cases of osteoporosis that mineral therapy alone shows such brilliant results. Many cases of true rachitis which have been helped by what was thought to be mineral therapy alone have undoubtedly owed their improvement to the inadvertent addition of vitamine containing substances, either in better diet regulations or of vitamine containing remedies of which ordinary cod-liver oil is a good example.

Consider another condition of disturbed metabolism very commonly seen as the result of the continued use of cereal decoctions or cereal gruels in the treatment of diarrheas in children, and to which the Germans have given the name "Mehlnährschaden" and study the various types of that condition, as Rietschel<sup>9</sup> has done, and then compare that symptom complex with the literature on beriberi epitomized in the recent paper by Willcox<sup>10</sup> in the *Lancet*. We find a similarity, point for point, which can leave but little doubt that the two conditions are identical. The etiology of both is analogous and an identical therapy relieves both.

We now come to the therapeutic principles underlying the management of these cases which also seem to substantiate the

writer's belief in their common origin and interrelation. Regarding scurvy there is but little to add to what is already known in relation to its successful treatment. We fully recognize the causative factors and have no further doubt as to the value of fresh extracts, especially fruit juices in the treatment. There never was any question as to the frank cases with typical symptomatology which were seen at five or six months, but the more recent researches have confirmed the already known facts that an early scurvy, characterized by a deficiency in growth and nutrition without other discernible symptoms is very common and can be offset by the use of antiscorbutics as early as in the first month of life. What are the antiscorbutics? Vitamine containing substances possessing the same general chemico-physical properties as substances containing anti-beriberi vitamine. Therapeutically and physiologically, in the light of our present knowledge of these substances there may be a difference between the various vitamines. For example Hess<sup>11</sup> claims no therapeutic result from the use of autolyzed yeast—a substance containing an enormous amount of the anti-beriberi vitamine—in the treatment of his cases of scurvy. On the other hand Allan Brown<sup>12</sup> says that autolyzed yeast has decided antiscorbutic value if used in sufficient dosage. Recent animal experiments carried out by Funk show that, although the vitamine contained in fruit juices is far better adapted for the prophylactic or curative therapeutics of scurvy, than the form contained in autolyzed yeast, still there is no doubt that the anti-beriberi vitamine of autolyzed yeast has some effect as an antiscorbutic while fruit juices have some effect on the retardation of beriberi in pigeons fed on polished rice the usual length of time.

It need not concern us, however, as to whether the vitamine of fruit juice or that of autolyzed yeast influences the condition towards a cure, nor whether a different vitamine is concerned in each case. Suffice it to say that such a substance, or such substances, are concerned in correcting the deficiency of metabolism known as scurvy. Passing on to the therapy of beriberi or what the writer believes to be an identical condition of milder degree, "Mehlnährschaden," in infants kept too long on cereal decoctions, we find a striking analogy in the prompt results obtained from the use of vitamine-containing substances; in these cases, however, the substance contained in autolyzed yeast seems to exert a better influence than that contained in fruit juices. More and more evidence is accumulating from day to day in support of the deficiency basis of pellagra, a condition not as uncommon in children as may be supposed. The etiology of this affection which seems to stand the test of experience the best, was thoroughly worked out and described in Funk's book "Die Avitaminosen" and has more recently been verified by Goldberg's<sup>13</sup> work. Cases of pellagra which the writer was able to follow through the courtesy of a colleague residing in the South and which were treated with autolyzed yeast under the writer's direction, either showed a very rapid improvement or else complete disappearance of symptoms in a very short time.

We now come to the consideration of rickets and such allied conditions as osteogenesis imperfecta and osteomalacia, for, after all, if we study the conditions under which the last two diseases appear, and also study their main symptoms, we find that the time of life at which they appear, plays the main role in differentiating them as

pathological entities. Osteogenesis imperfecta is most active in the formative or fetal period, rickets is most common in the growing period and osteomalacia in the adolescent or adult period when new functions or requirements are suddenly thrown upon the metabolism without proper precautions. All three at periods when a more active metabolism than merely vegetative becomes a necessity. Now, if we are willing to accept these last named conditions as deficiency diseases upon completely the same footing as we do scurvy, beriberi and pellagra, we will come far nearer an ultimate solution of the most complex problems which they may present than from any other standpoint. Furthermore if we accept them as avitaminoses as Funk has suggested some years ago, we will find ourselves still closer to a solution of the etiology and, therefore, therapy of the condition. From the very earliest days since the recognition of rachitis as a pathological entity codliver oil has been considered the most efficient remedy in the treatment of this disease. To this remedy were added the various adjuvants in the way of mineral salts, believing thereby to supply them for use to the tissues, failing, at the same time to appreciate the fact that, in the overwhelming majority of cases, the tissues were receiving, through the food, an ample supply of these salts, but that the trouble lay in the fact that, owing to some grave fault in the body economy, they were not able to retain them. As time went on results obtained from codliver oil were not as uniformly encouraging as the earlier reports seem to indicate. Among the various explanations of this discrepancy of result, none seems more rational to the writer than the probable destruction of vitamine as the result of the manifold processes of refinement to which codliver oil has been more

recently subjected. The crude oil has been proven by actual experiment upon various animals to contain a very considerable proportion of an exceedingly active vitamine, which vitamine is either partially or totally inactivated by the various processes of refinement and has even been demonstrated in some of the discarded fractions of the oil. Funk<sup>14</sup> has shown that a fraction which he has isolated from the crude oil and which is in many cases absent in the highly refined oils is curative of beriberi in pigeons and preventative of a condition identical with rachitis found in chicks. Personal inquiries among wholesale druggists as to why the "black" codliver oil has become unobtainable, elicited the information that its importation is prohibited by the Federal authorities. In the light of the work before us, this prohibition should be rescinded. In judging the value of vitamine therapy in rachitis one must bear in mind that we are dealing with a deficiency of metabolism very much more chronic than in the case of scurvy or beriberi and, therefore, the symptom complex is much slower in developing than in the other conditions mentioned; furthermore, in the cases of longer standing, the anatomical maldevelopments resulting from abnormal growth, as an aftermath of an undue proliferation with or without subsequent resorption of what would otherwise be normal cell or tissue constituents, produce deformities or weaknesses which only time can, to a greater or lesser degree, under favorable conditions, regulate by compensatory growth. With the foregoing clearly understood the writer has no hesitancy in claiming decided and prompt benefit as a result of vitamine therapy, in eliminating the demonstrable active processes of rachitis such as the anorexia, anemia, headswests, increasing deformity, and electric hyper-

irritability. Cases of rachitis in which tetany is present respond especially well to an increase in daily vitamine intake. Metabolic experiments upon rachitic children under vitamine therapy had been planned but the presence of the poliomyelitis epidemic in the city made it difficult to obtain subjects for the metabolism beds placed at our disposal through the kindness of Dr. H. D. Chapin at the New York Post Graduate Hospital. However, when possible, this work will be carried out along lines suggested by the results of animal experiments already completed. Still after all is said and done, and taking the difficulty of influencing the anatomical changes for the better, once they have occurred, into consideration, probably the greatest field for the employment of vitamine therapy will be for prophylaxis. We have seen, above all, that our first duty lies in the regulation of the maternal diet during pregnancy as well as during lactation. This problem does not present many difficulties. Excessively cooked foods should be avoided. Vegetables should rarely be cooked over twenty minutes and always served with the fluid in which they were cooked, to conserve the valuable vitamine containing substances as well as those inorganic salts soluble in the liquor. Disproportionate amounts of carbohydrate foods should be guarded against unless balanced by the presence of a sufficient quantity of other fresh foods. Maternal regulations are especially important in cases of breast fed babies where evidences of metabolic deficiency show themselves. In short, either a corrected diet for the mother or else some form of vitamine, perhaps in the form of autolyzed yeast may be directly administered to the nursing. In the case of artificially fed infants the early addition of vitamine containing substances and a very decided decrease

of the amount of highly milled overcooked starchy foods is to be recommended. The important vitamine of orange juice should never be neglected, even at one month, as a prophylaxis against scurvy and, perhaps even as against rickets. Egg yolk, coddled, in gradually increasing doses beginning as early as the sixth month, if necessary, is an important vitamine containing substance often omitted on account of a possible anaphylaxis which some children have against egg albumin. There is no recorded case of anaphylaxis against egg yolk as far as the writer has been able to find, either in his own experience or in that of others. The writer has administered carefully isolated egg yolk in two cases of decided anaphylaxis against the albumin, with no ill effects. If infants refuse the yolk pure it may be combined with a cereal and no difficulty will arise especially if we begin with a small amount. Large amounts of cereals should not be administered unless egg yolk or vegetable juices lightly cooked are administered at the same time. Beginning with the eighth or ninth month, to maintain a metabolic balance and to prevent a condition of which underdevelopment is an example and rachitis is typical, the child should receive mixed purées of various vegetables properly blended, with the addition of sufficient carbohydrate and fat to make a "balanced ration" (as our veterinarians term it). The writer has never found beef juice nor broths of any kind to serve any purpose that could not be served far better by the means just referred to, with more calories to the child's credit. Egg yolk serves a hundred fold more available iron, to say nothing of the nutritive value and vitamine content referred to above, and it is recognized that pure milk or milk and cereal diet is far too low in iron to

serve the needs of a child over eight months.

As the result of careful investigation as to the diet of mothers who have rachitic children, and especially those who have had other children who have had some form of deficiency disease, and furthermore, as to the diet of women during pregnancy, or during lactation, the writer has come to the opinion that the tendency toward deficiency disease, if not the disease itself, is inculcated *in utero*. In other words if the child is not born with the deficiency disease, at least it is born with such an unstable metabolic balance that it takes but correspondingly little unbalancing of the diet to account for the development of very marked symptoms of one or the other of the deficiency diseases. The negro and Italian in this country give us all the evidence necessary to give this theory a very sound basis to rest upon. We need not here go into the dietary of the negro and Italian; its peculiarities especially as to excessive carbohydrate constituents and excessive stewing with lack of fresh foods are familiar to any one caring to make a study of a series of these mothers and their babies. The varied results obtained in some of our larger foundling institutions and nurseries and even one's private experience with feeding formulae find an explanation in this predisposition to deficiency disease on the part of some infants. One child will thrive beautifully on a diet which would give another rickets. Another child will gain a half pound a week on what apparently starves another of the same age. In the former, the child's economy is well within the safety zone of metabolic stability, as a result of a properly proportioned diet of the mother during pregnancy, and so furnishes enough vitamine from the full supply with which it was born to counterbalance an excess of carbohydrate in his

formula, and his tissues grow and perform their functions. In the latter, the child has an unstable metabolic balance, owing to the improper selection of the maternal diet and therefore cannot supply the necessary vitamine from its own economy, since it has none to spare; the metabolism is upset, a negative balance of the inorganic salts results, valuable food constituents are not retained by the tissues, the child either develops a deficiency disease, or simply fails, and the more we "strengthen" its formula by adding carbohydrates (even if the other constituents are also added) we simply make things worse. The solution lies in adding a vitamine-containing substance. As typical of this last fact, the author has a case on record wherein a child whose weight remained almost stationary for nineteen days, gained an average of nine ounces a week for seven weeks without any change in its formula, by the addition of 5ss autolyzed yeast t. i. d. to its daily diet.

This brings us to the next important consideration. In the absence of ideal conditions whereby sufficient active vitamine can be obtained from properly prepared fresh vegetables, eggs and the like it remains for us to obtain a substance rich in active vitamine and at the same time stable and constant in efficiency.

In reviewing the literature on the use of yeast as a therapeutic measure we are led back to the very dawn of medical history. Still Schaumann<sup>15</sup> was the first to show that brewer's yeast displays what was then called "antineuritic properties" for pigeons and other fowls fed on polished rice. He noted that this yeast was far richer in these properties than were other substances which he had investigated. Funk<sup>16</sup> was able to show that the substance in question is of simple chemical nature

since hydrolysis with acids strong enough to break down all the complex substances known in nature, resulted in the isolation of an active substance which he called "vitamine." Chamberlain, Vedder and Williams<sup>17</sup> and also Voegtlind and Towles<sup>18</sup> went even a step further and ascertained that the hydrolysis yielded a more active preparation than a simple extraction of the yeast. Finally Cooper<sup>19</sup>, by leaving pressed yeast in an incubator for about thirty hours at body temperature obtained an hydrolysis by means of the inherent ferment present in the yeast cell similar to that produced otherwise by an extraneous acid as Funk had done. This constitutes what is known as the autolysis of yeast and the resulting product is known as autolyzed yeast. Owing to the enormously active metabolism of the yeast plant itself it contains perhaps the greatest amount of active vitamine per bulk of substance of any product thus far known. When filtered, the filtrate may be standardized as to vitamine content and, therefore, dosage, by noting the average time it takes to cure a number of beriberi pigeons when 0.10 cc. is injected subcutaneously, as compared with the known time required by a standard vitamine preparation to produce the same result. We have, therefore, a standardized substance which, to be sure, has not been definitely determined upon as to maximum and minimum dosage, but which should possess special advantages for the pediatrician, not only in the care of his cases of deficiency disease, especially rachitis, since that is so common, but also in his management of stubborn feeding cases. With these facts in mind, it might seem desirable at the present stage of our knowledge, to administer this substance in selected cases in much the same way as we do fruit juices, that is to say, as

a prophylactic against deficiency diseases in our difficult infant feeding cases, instead of jumping about and modifying formulae with no other hope than that "perhaps we might strike it right." The multiplicity of feeding systems now in vogue and changing with every man's opinion leaves us no doubt that the element of chance and the kindness of Mother Nature are two forces which make infant feeding an "art" rather than a "science," at least until we are willing to accept other substances than proteids, fats, carbohydrates and inorganic salts as essential to success along these lines. With the acceptance of the foregoing as a basis for further research and observation, there seems little reason to doubt that a great step will have been made toward the better understanding of some difficult problems of infant feeding, and also lead to a greater opportunity for the study of the principles which underlie the various deficiency diseases.

In conclusion the author wishes to express his appreciation and gratitude to Dr. Casimir Funk for his permission to take part in, as well as make use of the results of his extensive animal researches in metabolism; to Dr. M. H. Edelman who carefully applied vitamine therapy, according to the writer's suggestions, to cases in his clinic, his results being embodied in this paper; to Dr. S. M. Howell of Cartersville, Georgia, who has applied the therapy in pellagra and reported to the writer, and to Messrs. Morgenstern & Co., who permitted the use of their laboratory equipment for the preparation of the large amount of autolyzed yeast which was necessary to carry on these experiments.

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## NOTES ON THE ROLE OF VITAMINES IN DEFICIENCY DISEASES.

BY

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Intestinal digestive disturbances have been usually attributed to faulty metabolism; and the food elements—fat, carbohydrate, and proteins blamed for such disturbance. Literature of not very many years back, gives ample proof of the faulty conception of food disturbances. One series of papers, published fifteen years ago, shows the proteins and casein to be the disturbing element, consequently the percentage of casein was greatly reduced. Later clinical research supposed the fat to

be the chief offender in causing digestive disturbance, therefore, cream mixtures and top milk mixtures were relegated to the rear.

Finkelstein found that sugar very frequently caused nutritional disturbance, hence sugar has been the cause of diligent research.

During the last few years Funk demonstrated the difference between food given without vitamines, and food given with vitamines. He also showed that a series of diseases, which he termed deficiency diseases, were caused by the absence of vitamines.

Now, what are vitamines? An excellent description of vitamines will be found in an article by Atherton Seidell, *Public Health Report*, Vol. 31, No. 7.

Vitamines are found in the external shell or kernel of the cereals. They can be extracted in the form of colorless needle-shaped crystals. They are necessary as a live factor in nutrition. If we give a cereal minus the hull or shell, we deprive the child of one of the most important elements of its nutrition—namely, its vitamine.

Vitamines are best administered in the form of yeast with yolk of egg. Funk has found that beriberi is not due to an infection or intoxication, but is caused by a deficiency of this vitamine.

The absence of vitamine is noticeable in polished rice, white bread, and starch. If to this food we add yeast or beans then we add vitamines which are required for the development of the organism.

Vitamines are sometimes dependent on the nutrition of the cows, thus we find that milk of cows lacking fresh fodder, as for example in winter, will produce less vitamine. It is therefore quite plausible that

the use of such milk may be a factor in the causation of rickets.

Funk states that the vitamines are partially destroyed by modern heating of the milk, and are completely destroyed by the sterilization of milk. But we can add vitamines to milk, and thus render it nutritious and antiscorbutic.

The absence of vitamines in the food is responsible for the development of specific diseases which have been called, deficiency diseases or avitaminoses. Rickets, scurvy, or Barlow's disease, pellagra, and beriberi are some of the diseases belonging to this group.

When pigeons are fed on rice from which the vitamines have been removed, they linger and die. If rice from which this substance has been removed is fed to adults or children, beriberi results. Funk found that when this specific vitamine was given to such patients, although fed on polished rice, they recovered.

Rickets was long believed to be due to a lack of sufficient proteins and fats in the diet. It is now recognized that rickets is most likely due to the absence of the vitamines which are necessary for the proper metabolism of fat and protein. That the vitamines stimulate the thymus and the parathyroids seems plausible and when they are absent from the food there results either rickets or tetany.

*Antiscorbutic Diet:* Fresh green vegetables like salad, cauliflower, onions, potatoes, apples, orange, lemon, raw milk, yolk of egg, meat, wheat, oats, and barley. Juicy fruits and vegetables lose their vitamines (scurvy vitamine) entirely on drying or heating to 212 degrees F. for one hour. The action of the vitamines resembles that of hormones and the secretions of the ductless glands. Albuminous substances vary in

their nutritive value depending on the presence or absence of amino-acids. In like manner there are certain foods the value of which is dependent on the presence of their vitamine content.

Chemical examination shows that vitamines occur in maize, in very similar fashion to rice in the peripheral layers.

## OSTEOMALACIA.

BY

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The diagnosis of osteomalacia before the onset of deformities is impossible. The vague attacks of pain, increased by motion; the sense of fatigue and a variety of general functional disorders about the digestive, circulatory and respiratory apparatus are all too indefinite to justify conclusions in regard to their origin. Only when spontaneous fractures occur and deformities indicating softening of the bony structures appear, can the presence of osteomalacia be suspected.

If fragility of the bones, poor healing of fractures and deformities, particularly about the vertebrae and the pelvic bones occur in a woman during pregnancy or in a woman manifesting signs of ovarian disease, then the diagnosis becomes more probable.

In view of the fact that rachitis, which presents similar clinical signs about the bony structures, is essentially a disease of infancy, the only condition that must be differentiated is syphilis; and this can readily be done by appropriate specific tests.

From the standpoint of pathological anatomy and chemistry, there is, as far as the end result is concerned, a certain similarity between rachitis and osteomalacia. The two differ, however, in this respect:

has been so successful in the writer's hands in intractable cases of this kind. Chronic or acute changes in the skeleton, especially in the long bones, are too well known and so generally apparent in all of the deficiency diseases that neither space nor time need be given to its discussion here. Blood changes ranging from a simple anemia of short duration to the very severest blood pictures lasting over long periods, perhaps throughout life, are common to all of the deficiency diseases depending upon their severity or duration. Changes in the ductless glands have been so marked in practically all of these diseases that reasonably enough, the gland disturbance has often been looked upon as the etiological factor in the disease in which it was affected. Perhaps it is the ductless gland upon which the unbalanced diet works its first havoc and then the abnormal secretion of the particular gland affected determines the nature of the deficiency disease which manifests itself. This is a matter for future research to decide. Vitamines may be substances out of which the ductless gland obtains some element necessary to the elaboration of its specific secretion. Lastly, and perhaps due to causes just cited as speculative, we find in all cases of deficiency disease of one type or another, more or less marked hindrances to the normal growth and development of the entire organism, the degree being dependent upon the duration and previous intelligent efforts made towards a cure. This, after all, is the most important factor to be considered in the care of this class of cases.

We must make certain not to confuse the true deficiency diseases with conditions due to a diet definitely lacking in the necessary inorganic salts; such a diet actually deprives the organism of the materials to build with

and thereby produces a condition termed osteoporosis. Osteoporosis promptly disappears when these salts are administered in proper amount independent of any other addition to the diet. We have assumed in our discussion that the diet of the cases of deficiency disease which we see is sufficiently rich in these inorganic salts, but that, in spite of their presence in ample amount they are not retained and utilized by the little patient's economy. A true avitaminosis. Osteoporosis is not a true avitaminosis and should not be confused with rachitis nor osteomalacia. It is in cases of osteoporosis that mineral therapy alone shows such brilliant results. Many cases of true rachitis which have been helped by what was thought to be mineral therapy alone have undoubtedly owed their improvement to the inadvertent addition of vitamine containing substances, either in better diet regulations or of vitamine containing remedies of which ordinary cod-liver oil is a good example.

Consider another condition of disturbed metabolism very commonly seen as the result of the continued use of cereal decoctions or cereal gruels in the treatment of diarrheas in children, and to which the Germans have given the name "Mehlnährschaden" and study the various types of that condition, as Rietschel<sup>9</sup> has done, and then compare that symptom complex with the literature on beriberi epitomized in the recent paper by Willcox<sup>10</sup> in the *Lancet*. We find a similarity, point for point, which can leave but little doubt that the two conditions are identical. The etiology of both is analogous and an identical therapy relieves both.

We now come to the therapeutic principles underlying the management of these cases which also seem to substantiate the

writer's belief in their common origin and interrelation. Regarding scurvy there is but little to add to what is already known in relation to its successful treatment. We fully recognize the causative factors and have no further doubt as to the value of fresh extracts, especially fruit juices in the treatment. There never was any question as to the frank cases with typical symptomatology which were seen at five or six months, but the more recent researches have confirmed the already known facts that an early scurvy, characterized by a deficiency in growth and nutrition without other discernible symptoms is very common and can be offset by the use of antiscorbutics as early as in the first month of life. What are the antiscorbutics? Vitamine containing substances possessing the same general chemico-physical properties as substances containing anti-beriberi vitamine. Therapeutically and physiologically, in the light of our present knowledge of these substances there may be a difference between the various vitamines. For example Hess<sup>11</sup> claims no therapeutic result from the use of autolyzed yeast—a substance containing an enormous amount of the anti-beriberi vitamine—in the treatment of his cases of scurvy. On the other hand Allan Brown<sup>12</sup> says that autolyzed yeast has decided antiscorbutic value if used in sufficient dosage. Recent animal experiments carried out by Funk show that, although the vitamine contained in fruit juices is far better adapted for the prophylactic or curative therapeutics of scurvy, than the form contained in autolyzed yeast, still there is no doubt that the anti-beriberi vitamine of autolyzed yeast has some effect as an antiscorbutic while fruit juices have some effect on the retardation of beriberi in pigeons fed on polished rice the usual length of time.

It need not concern us, however, as to whether the vitamine of fruit juice or that of autolyzed yeast influences the condition towards a cure, nor whether a different vitamine is concerned in each case. Suffice it to say that such a substance, or such substances, are concerned in correcting the deficiency of metabolism known as scurvy. Passing on to the therapy of beriberi or what the writer believes to be an identical condition of milder degree, "Mehlnährschaden," in infants kept too long on cereal decoctions, we find a striking analogy in the prompt results obtained from the use of vitamine-containing substances; in these cases, however, the substance contained in autolyzed yeast seems to exert a better influence than that contained in fruit juices. More and more evidence is accumulating from day to day in support of the deficiency basis of pellagra, a condition not as uncommon in children as may be supposed. The etiology of this affection which seems to stand the test of experience the best, was thoroughly worked out and described in Funk's book "Die Avitaminosen" and has more recently been verified by Goldberg's<sup>13</sup> work. Cases of pellagra which the writer was able to follow through the courtesy of a colleague residing in the South and which were treated with autolyzed yeast under the writer's direction, either showed a very rapid improvement or else complete disappearance of symptoms in a very short time.

We now come to the consideration of rickets and such allied conditions as osteogenesis imperfecta and osteomalacia, for, after all, if we study the conditions under which the last two diseases appear, and also study their main symptoms, we find that the time of life at which they appear, plays the main role in differentiating them as

sore, the gums will bleed, and the teeth become loose.

*Gastric Symptoms.*—Nausea, burning sensation in the epigastrium, and perverted appetite. Many cases continue to have a good appetite, while a few suffer with anorexia.

*Intestinal Symptoms.*—On palpation, a soreness is found all over the abdomen. In chronic stages, there is gaseous distention with relaxation of the abdominal muscles; diarrhea is often one of the first and most persistent symptoms throughout the disease. The rectum is inflamed, and sometimes ulcerated. In the last stages of the disease patients lose control of the sphincter muscles in many cases.

*Mental Symptoms.*—Most patients are forgetful, suffer a great deal with insomnia, and are confused. Neuritis is another common symptom. Many cases have to be committed to insane hospitals, the patients often becoming maniacal. Very often nervous symptoms clear up when the disease does. However, this is not always the case.

*Odor.*—Another very characteristic symptom of this disease concerning which I have noticed little or no mention, is the patient's odor. It seems to be caused by saprophytic bacteria, as the odor is very like that produced by these bacteria.

*Genito-urinary Symptoms. Kidneys.*—Frequent micturition, and an excessive amount of urine; *laboratory findings*, many blood cells and some epithelial cells. In women, a vaginal discharge is common, which has a very offensive odor, and many times extends into the bladder, producing a cystitis.

*Fever.*—Although some authors claim there is no elevation in temperature, I have found that in the acute stages the temperature frequently ranges from 101° to 102°.

*General Appearance.*—As a rule, the patients show an anxious facial expression with glary eyes. There is usually emaciation and anemia, and muscular weakness is also noted, often to a marked degree.

*Sequelae as well as Symptoms.*—Among the nervous manifestations, neuritis, neurasthenia and insomnia often occur. Edema of face and extremities, evidently due to weakened heart action, is also frequently observed, while enlargements and stiffening of joints, especially of the knee joints, often develop. Nephritis of the parenchymatous variety is not uncommon.

I have often noticed pyorrhea alveolaris in pellagrous patients. Whether it is a coincidence or a direct result of the disease is yet to be determined.

That pellagra predisposes or lowers the patient's resistance to tuberculosis seems established beyond question.

*Pathology.*—The gross pathology invariably shows a congested condition of nearly all the viscera, especially of the kidney, liver, stomach and intestines. The larger intestines are usually much larger than normal and have undergone ptosis.

*Treatment.*—My experience has covered about four hundred cases, about three hundred and fifty of them being among insane patients, and about fifty among sane people. The insane cases are the ones I paid more close attention to, and the success I have obtained is in handling these cases. The majority were unsatisfactory owing to the complication of insanity, and really were not suitable to give the treatment a fair test; however, many of these cases were very sane, easily managed, and followed instructions well. I will enumerate the different measures which have been tried and the results therefrom. All these cases received a

special diet in connection with their medicinal treatment.

Following are some of the remedies employed:

Thirty drops of dilute nitric acid four times a day in a glass of water. Copper arsenite, beginning with  $\frac{1}{100}$  and increasing it to a very large dose. Sodium cacodylate. While the patients were receiving these drugs they were treated symptomatically also with other therapeutic agents.

*Routine Methods.*—Six meals a day, if the digestive system can tolerate it, the diet being given in a semi-solid form. Most of them receive it in liquid form. The following foods constitute the diet: Field peas, and soup of the same, lima beans, soft boiled eggs, beef juice and broth, fruits of all kinds, crackers and loaf bread. In one prescription, of which the patient receives one teaspoonful after each meal, are the following ingredients in half size doses, owing to the fact that they receive it six times a day, or if given three times a day, in full size doses: Elixir lactated pepsin, tr. nux vomica, Fowler's solution, and dilut. hydrochloric acid. For the stomatitis an alkaline mouth wash and gargle is used.

*Nervous Symptoms.*—These are controlled by bromides, morphine or chloral well diluted in a liberal quantity of water. Morphine in particular acts very pleasantly with the insane class of patients, as it allays excessive peristalsis, checks nausea and also quiets the patient.

*Diarrhea.*—In this condition, bismuth in large doses with tr. camphorated opium acts very pleasantly, especially in acute stages. In the chronic stages an astringent is often demanded. High colonic irrigations of starch and opium enemas are sometimes very serviceable. For vaginitis, perman-

ganate of potash douches twice daily afford marked relief.

*Skin Lesions.*—For a local dressing, castor oil iodinized—about two parts of iodine to one hundred parts of castor oil—acts very satisfactorily.

*Supportive Treatment.*—It is well, if the case is a long drawn out one, or the nervous symptoms are unusually pronounced, to give some supportive treatment. To this end it is well to use tr. nux vomica or tr. digitalis. Often there is a myocardial degeneration, and in many cases, after one thinks the patients are well and able to be up, they will suddenly topple over and die in a few minutes. It is well to keep these patients with bad hearts in bed a long time.

## PELLAGRA: ITS CAUSATION AND ALLEVIATION.

BY

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After a protracted and continued study of both the clinical and pathological aspects of pellagra, I have come to the definite and fixed conclusion that pellagra is a metabolic disease, a disease due to nutritional deficiency or nutritional imbalance. Poverty and bad hygiene furnish a favorable soil for its development and promote its progress and aggravate the disease itself, but these in themselves do not cause the disease except in this respect, that the economic condition of a country determines the diet of the people. During the reign of Napoleon I., pellagra appeared in France and flourished after his reign, which was a period of extreme poverty in that country. France soon, however, recovered herself and became a prosperous country as a result of which

pellagra has decreased to such an extent that the disease is now a very rare one. (It will be interesting to see to what an extent the economic depression following this war will affect the diet and whether or not pellagra will increase). Taking the foregoing with the history of the disease and the countries in which it is most prevalent, Italy and Egypt, together with the fact that it has not been described in aboriginal or primitive races; reasoning from the known cause of scurvy, also the known cause of beriberi and its variety of symptoms and forms, and finally considering the lack of definite and characteristic post mortem lesions in pellagra, notwithstanding its variety of symptoms and manifestations, I have arrived, perforce, at the conclusion that the cause rests in some nutritional imbalance or deficiency. And in conjunction with and bearing upon the same point, I have considered the strange effect of etherization upon pellagrins; ether anesthesia more than chloroform anesthesia aggravates and in a great many instances will relight the disease, acting in a very similar manner as anesthetic does when it produces delirium tremens in an alcoholic. Now whether the etherization adds toxic metabolic substances or destroys necessary products of metabolism within the system, I am unable to determine. Vedder has recently remarked the similarity between pellagra and other deficiency diseases; he says, "a deficiency is demonstrable in the diets of most pellagrins; this deficiency appears to result from the too exclusive use of wheat flour in association with corn meal, salt meats and canned goods, foods that are known to be deficient in vitamines."

All physicians who have had much experience in the treatment of pellagra agree upon

one point, and that is that the milder cases improve if kept in a hospital in bed, at rest and upon a fairly liberal diet with plenty of fresh meat and meat juices. Ordinarily pellagrins consume a large carbohydrate diet. And in this connection it is interesting to know that only in the last few years has the difference in composition of proteins been brought out. Fischer, Abderhalden, Mendel and Osborne have shown great variations in composition of proteins in regard to content of various amino-acids. Certain proteins lack or are deficient in certain amino-acids necessary for growth and maintenance. All proteins derived from animal sources, with the exception of gelatin, seem to be suitable for human consumption as they contain all of the necessary components in right proportion. Some of the vegetable proteins are deficient in this respect, but as yet it has not been sufficiently proven which article of diet is the offending or causative agent. Funk claims that vitamines are essential for the maintenance of health. Animal foods and vegetables contain these in varying amounts; meats are especially rich; polished rice is devoid of them. Funk argues that pellagra is a disease due to the lack of vitamines in the food, analogous to the production of beriberi through the large consumption of polished rice. And when one considers the changes in the diet of the people of the South which have occurred during the rapid development within the last decade or two, together with the effect of the climate upon those eating this diet, it is unscientific to assume that the increase in pellagra cannot be due to such changes. Goldberger's recent work has gone a great way to prove the foregoing assumption.

The Thompson-McFaddin Pellagra Commission has worked in Spartanburg County,

S. C., where practically all pellagrins are mill hands and conditions are not comparable to other countries where the disease is just as prevalent. Yet they came to these conclusions as a causation: (1) The *simulium* is discredited. (2) Animal inoculation and experimental study of intestinal bacteria have not yielded conclusive results. (3) No evidence of inheritance is obtainable. (4) The immediate results of hygienic and dietetic treatment in adults have been good, but after returning to former conditions of environment and living, most of these cases have recurred. The prognosis in children is much more favorable. (5) Occupation has no influence.

As to the infective nature of the disease the Thompson-McFaddin Commission arrived at only two conclusions which have any bearing upon this point. These are: "(1) The American form is more severe, notably more so than that in the West Indies and Egypt; coinciding with the experience that a new disease or an acute infection is more prolific in a virginal soil. (2) The Commission is inclined to believe that pellagra is in some way transmitted to a non-pellagrous person from a pre-existing case and that one of the important factors in this transmission is the residence in the immediate neighborhood of a pellagrin." I believe that similar economic conditions and diet have the greater influence. In certain hospitals for the insane we have ascertained that pellagra is usually more prevalent and persistent in the wards housing untidy patients. Only in two cases have I seen evidence of transmissibility. The first case occurred in the Austin (Texas) Lunatic Asylum in a patient who had been in the institution 14 years, yet developed the disease in six months after living in the hospital in close contact with a rapidly fatal case of

pellagra. The second case was in a series. Mrs. R. of New York, a Buddhist by religion had eaten no meat for years. Her sister Mrs. M. of San Antonio developed pellagra. Mrs. R. came south to nurse her sister and six months after being south and being upon a strict carbohydrate diet developed pellagra and was sent to the New York Post Graduate Hospital to be treated by the Pellagra Commission. These two ladies had another sister in Runge, Texas, who lived upon a diet similar to theirs but under different housing conditions, and who developed a mild case of pellagra three months after her second sister.

Pellagrous patients are more frequent in the untidy insane wards; yet these wards house the senile, the demented, the aged chronics, and the more or less helpless idiots in whom gastrointestinal disturbances are more common than in the other class of patients in the same institution where it is possible for them to eat all sorts of food in a proper manner and where they do not eat large amounts of carbohydrates or bolt their meats in hunks if they eat any at all. The greater portion of the diet in these institutions is carbohydrate, consisting of bread, beans, peas, rice, grits, potatoes, tinned or canned foods and salted meats, and the disease, pellagra, runs hand in hand in comparative frequency with the occurrence of beriberi. Twelve years ago the Austin Insane Asylum experienced so much beriberi that rice had to be eliminated from the diet. Goldberger seems now to have successfully demonstrated the relation between pellagra and an improper carbohydrate diet. These facts when taken into consideration point, more clearly and more conclusively towards a carbohydrate dietary as the offending factor than towards a parasitic or infective origin for the disease.

**Treatment.**—The treatment of pellagra should be based, therefore, upon the dietetic origin of the disease. First and foremost is the use of fresh meats, and meat juices. For this purpose fresh beef or fresh mutton are the meats used. The carbohydrate element of the diet is reduced to a minimum and for this purpose it is best to use the green starches rather than the dried starches. The next most important feature in the treatment is rest in bed, protection from the sunlight, and a strict hospital regime. It is a good idea to send all patients here in Texas to the colder climate such as Colorado and keep them there from May until the first of October. Tonics should be given for their alterative and stimulating effect; arsenic is one of the best employed but has no specific action. The other symptoms should be treated symptomatically. The skin lesions and the stomatitis can be greatly alleviated by the use of staphylococcal vaccines. In this connection it is very interesting to report a case of a lady patient who has a so-called angio-neurotic edema of the neck and hands together with some gastro-intestinal symptoms whenever she is exposed to the sun. This case to my mind is a case of mild incipient pellagra. As a matter of experiment some of the pus from her gums was taken and cultured. A staphylococcal vaccine was made from this and her improvement was remarkable. I think from this case and others which I have seen that the use of staphylococcal vaccines will be found of uniform value in pellagra so far as the skin, mouth and gastro-intestinal lesions are concerned. It is my firm belief, however, that a liberal diet in which fresh meats play a major part, cold climate and hospital regime constitute the treatment *par excellence* for pellagra.

## THE RELATION OF VITAMINES TO ANIMAL GROWTH.

BY

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Ever since Stepp<sup>1</sup> demonstrated that the growth promoting element in the diet could be removed by extraction with alcohol, the lipoids, which constituted the bulk of the extract, were supposed to be the factors which enabled the animal body to attain adult size and weight. The subsequent researches of Funk on the etiology of beriberi revolutionized some of the current conceptions of nutrition and indicated a new avenue of approach towards the solution of animal growth. The plan which proved so successful in the antineuritic investigation was applied to the elucidation of the growth problem.<sup>2</sup> The experimental evidence accumulated since then is now sufficient to substantiate the vitamine thesis in regard to this important phase of animal physiology. The term "vitamine" is used to designate the group of substances in the animal diet which are present in minute traces, whose nature and chemical constitution are unknown, and whose absence will result in a series of pathological changes which can only be overcome by addition of these essential factors. The name is simply a class designation, and is now only considered as such.

The usual method of procedure in the investigation of animal growth is to make up a "synthetic diet." Mixtures are made of purified protein, starch, sugar, fat, a combination of inorganic and organic salts, and a trace of agar-agar to ensure an indigestible residue and prevent constipation. This mixture, if made up of chemically pure materials, does not enable a young animal to grow for more than seven to ten days.

During this period the subject of the experiment utilizes the surplus stock of vitamines stored in its tissues, and when this is exhausted, growth ceases. A decline in weight follows, and death ensues after 30-40 days, if no other food than this mixture is given. This same diet will not enable an adult animal to exist longer than the period mentioned above. Substances supposed to contain abundant supplies of vitamines are mixed with this "synthetic diet"; or they may be fractionated by means of solvents and reagents, the residue from the fractions combined with the synthetic food mixture, and their influence (positive or negative) ascertained on the growth curve, as well as their capacity for maintaining life for prolonged periods. The best of these diets, although sufficient in every respect, does not include the psychic elements of taste and smell, which stimulate the digestive processes. Consequently in prolonged experiments the animals fed on all "synthetic diets" even sufficient in vitamine content become very susceptible to variations in temperature, infection from microorganisms, etc., and the condition resulting from the influence of these factors has been sometimes erroneously attributed to a deficiency in the diet. In several instances a number of investigators unconsciously employed vitamines in their food mixtures, since casein, lactose and substances prepared from milk have retained these all-important accessories as impurities in quantities sufficient to influence materially the course of the experiment. The absorptive power of these food preparations for the vitamines is considerable, and measures used to completely remove the absorbed materials often impair the nutritive value of the foodstuff itself. This fact has not until recently been re-

garded with sufficient consideration by the majority of workers in this field.

Ever since Stepp emphasized the importance of the lipoids in nutrition, the fat fraction of all diets and artificial food mixtures has been the subject of careful investigation. Practically every worker in the field of animal growth investigation agrees that butter fat possesses some essential which is not present in lard or commercial fats and oils, with the exception of cod liver oil.<sup>3-4</sup> This fat-soluble accessory has been called by McCollum<sup>5</sup> "growth substance A." The butter fat is, however, not antineuritic, as rats fed on diets containing butter fats, while otherwise vitamine-free, usually decline in weight and die in that tetanic condition observed in avian polyneuritis.<sup>6</sup> Later publications<sup>7</sup> contain evidence indicating that the butter fat owes its superiority over the other fats mentioned above, partly at least to its antiscorbutic properties. Thus animals fed on butter fat-free diets in which the antineuritic vitamine is administered in the form of yeast products, with lard as the fat component, ultimately display a symptom-complex resembling scurvy, and a ragged external appearance, accompanied by a diminution or failure in the growth increment. When butter fat is substituted for lard in these cases, the pathological conditions disappear, the animal resumes its normal appearance, and grows at the normal rate. There is possibly another factor present in butter fat besides the antiscorbutic vitamine, the presence and nature of which will have to be ascertained by future research.

In addition to the factor mentioned in the previous paragraph, another accessory is essential for growth. The use of the method employed by Funk in the isolation of the antineuritic vitamine has been ap-

plied to the preparation of fractions from autolyzed yeast, yeast hydrolyzed by 10% sulphuric acid,<sup>8</sup> and from the alcoholic extract of sheep pancreas.<sup>9</sup>

In each of these cases the fraction which, added to the artificial diet, enables the animal to grow, is the one from which Funk isolated the antineuritic vitamine in his research on avian polyneuritis. Probably this particular growth substance is identical with the substance whose deficiency produces the avian beriberi. Its behavior towards solvents, precipitating reagents, and to the action of alkalies and acids is identical with that of the antineuritic fraction isolated by Funk which remedies the deficiency in beriberi. Stepp has advanced the opinion that vitamines and lipoids are the two essential factors in nutrition during the growth period.<sup>10</sup> The physiological activity of these growth-inducing fractions from yeast and pancreas depreciates with each successive step in the preparation of the crude fraction, as in the case of the antineuritic vitamine; and considerably larger quantities are necessary to enable the animal to attain its customary growth increment than are required to effect a cure in the case of polyneuritic pigeons. This substance is probably identical to that designated by McCollum as "growth substance B." These growth fractions can be precipitated by phosphotungstic acid from yeast and pancreas, and the residue isolated from the precipitate added to the artificial diets. When lard constitutes the fat fraction the animals double their initial weight in a somewhat longer time than animals fed on a fully sufficient diet. Unless butter fat is included along with these vitamine preparations in these artificial diets, symptoms analogous to the scurvy symptom-complex ultimately appear, the

growth increment will decrease, and a marked decline in weight result. Further attempts at fractionating the residues from the phosphotungstic precipitate have been accompanied by a further depreciation in their physiological activity; thus far, however, attempts in this direction have not been entirely satisfactory.

These growth "vitamines" or "accessories" do not in themselves directly stimulate the growth of the animal cell. Their action in this respect consists in each and every specific vitamine being present in a diet otherwise adequate, and playing their part in maintaining the metabolic equilibrium. In this way the maintenance of the normal physico-chemical conditions is established, since the nucleus and protoplasm of the animal cell possesses the inherent capacity to grow and reproduce when adequately nourished. It is yet to be proved that there is any factor in the diet which alone can bring about growth of any animal cell for lengthy periods in the strict sense of the term "specific growth substance."

In view of the knowledge already in our possession, we can assume that these accessory growth factors are members of the vitamine group. The application of this hypothesis has yielded valuable information in this field, and at present is as good a starting point for further advances in the search for truth as any other. Scientific truth at the present time is only relative and must be moulded to meet scientific progress. No one but supporters of theological doctrine claim the undisputed possession of absolute truth and this must be borne in mind by all scientific investigators.

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## SCURVY—A DISEASE, A CONDITION OF TOXICITY, OR A DEFICIENCY.

BY

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Scurvy was described as early as during the time of Hippocrates and later more thoroly as a constitutional disease by Barlow. Its etiology still remains today somewhat obscure, altho many scientists have added the results of extensive experiments and observations to our previous knowledge. Temporary faulty nutrition will not cause scurvy. Such malnutrition must extend over a definite and lengthy period. Scurvy may be due to lack of some food constituents normal to metabolic processes (Graham). The cause may be of chemic origin due to continued use of food that either lacks some elements required for the child's nutrition, or which furnishes them in such a form that the body cannot assimilate them. Again there may be within the body a certain toxicity caused by the ingested food combining with pathologically inclined secretions. Breast fed infants are less liable to scurvy than those artificially fed, yet a definite condition of it was seen in a ten months old infant last summer, signifying that the mother, showing no classic signs herself, was malnourishing her offspring. Some-

thing, for example, must exist in milk other than the recognized proteids, fats, carbohydrates and mineral salts, for if in experimentation we chemically abstract certain elements of the milk and then add them together again, animals will die. Again, a too restricted diet of certain foods may cause scurvy, a point perhaps against restricted milk modifications, caloric feeding, etc. McLinnell mentions a patient 23 years old, of good health and physique, and with the exception of malarial attacks, he never had been ill. His diet consisted solely of porridge, white bread and butter since three years of age. He presented definite scurvy symptoms which came and went under restricted or more liberal rations. Experiments upon guinea pigs by Fürst with plant seeds exclusively produced scurvy, although in not so severe a form as by exclusive grain feeding. These plant seeds would however acquire antiscorbutic properties when infected with fungi. Froelich found that he could produce scurvy in guinea pigs by exclusively feeding them with raw or cooked milk although exclusive grain feeding produced severer results. However these little animals when fed on oats and raw milk did not develop scurvy—altho with oats and *boiled* milk they did.

F. Gowland Hopkins showed that young rats fed on a basic diet of casein, fat, carbohydrates and salts developed scurvy while the same diet plus fresh milk fed to other rats did not produce it. The former rats ceased to grow, the latter advanced normally. If young birds are fed on red unpolished rice they grow normally; if, however, they are fed on polished rice or white rice their growth ceases and polyneuritis develops with resulting death. Polished rice is that kind of rice which is deprived of husks, pericarp, subpericarpal layers, and its germ in the process of milling, with resultant de-

pletion of salts, proteins, fats and lipoids.

The above illustrations, therefore, tend to show that certain foods contain something or lack something that is necessary to enable them to fulfil their normal functions in the metabolic upbuilding of the body.

It would seem then that certain important questions confront us: is there in the specific body a toxic substance, neutralized, or destroyed and rendered inert by certain foods?

Do certain apparently normal foods in chemical combination and as ingested contain a poison or poisons sufficient to cause scurvy? Do certain foods on the other hand lack a certain element or elements essential to human normality? Do certain foods tend to stimulate metabolic processes, tone them up in fact, and render the ingested food more easily assimilated? Is there a lack of some basic principle or principles within the body, perhaps a true deficiency which certain articles of food replace?

Definite and accurate answers to the foregoing questions will in due time be answered by investigators. Happily we need not wait for them, for by certain foods given under certain conditions the ultimate successful treatment of scurvy can be accomplished. Some foods, be they meat, vegetables, fruits, salads, or cereals contain mysterious principles as part and parcel of them which now go under the name of vitamines. Altho Tibbles says "the chief constituents of foods are proteins, fats, carbohydrates and salts," clinical and experimental observations show that foods contain something more than albumin, globulin, glutelin, casein, stearin, palmitin, olein, sugar, starch and dextrose, as a matter of fact certain accessory substances essential to growth, development and the well-being of the organism. Exclude them and the body suffers and is liable

to disease. What these substances are is not well known altho the subject of much recent study. Various substances in general have been isolated whose presence in food influences nutrition favorably; their absence, however, does just the opposite; these have been called vitamines. It has been long known that animals grow quicker, larger and become heavier when fed on some kinds of foods than on others. The body suffers on a monotonous diet. Vitamines are found in fresh milk, eggs and yeast, meat extracts, yeast extracts, in growing grain, and in all grains which have not been deprived of their pericarp, (wheat, oats, barley, red rice, corn), and in the substances which have been removed from them (wheat bran, rice bran, corn bran, germ of wheat, and other cereals, also in beans and rapidly growing vegetables). Most fresh animal and vegetable juices contain vitamines. These are easily destroyed by exposure to heat, and disappear in foods kept a long time.

The vitamines are known to be derivatives of nuclein and nucleic acids. Professor Leonard Hill adds: "White bread contains no vitamines, for in the milling process the outer layers of the wheat berry are removed and the vitamines taken away. Whole wheat and black bread possess them." The sterilization of milk by boiling and often by pasteurization, and the canning of foods, meats, vegetables and fruits often deprive them of these sensitive principles. Foods should be fresh. When meats, vegetables and fruits are fresh their salts are partly dissociated and ionized and such ions are of importance for metabolic processes. When, however, foods are not fresh, when dried, pressed, tinned and treated in many other ways these salts are no longer in the ionic condition and are partially inert. An illustration: a guinea pig fed on fresh potatoes

alone will live for months and then die of malnutrition, but a pig fed on potatoes which have been dried and then boiled develops scurvy and dies in a few weeks. Similar conditions are seen when dried cabbage and carrots are used. These vitamines may be of two or more general classes, the one soluble in fats, while the second is soluble in water and alcohol. While vitamines are required in small amounts for normal growth yet a certain quantity must be present before growth can take place and the larger the quantity present in foods usually the greater the growth and the more persistent the control of scorbutic conditions.

Effront found that the non-protein nitrogenous substances (vitamines) in potatoes stimulate the enzyme action and the cell growth of individuals.

Reinhardt believes that vitamines are destroyed partially by drying and more completely by cooking and we know positively that these sensitive principles lose their virility when foods are boiled or preserved for too long a period. Cabbage, for instance, loses its vitaminic properties when heated to 110° C. for some time. According to Talbot and Peterson certain fresh vegetables lose their antiscorbutic properties in varying degree when dried; for instance, potatoes, carrots, dandelions, white cabbage, etc. Freshly preserved cabbage juice loses its antiscorbutic properties when heated from 60° to 100° C for 10 minutes. Again pressed dandelion juice loses similar qualities when heated for a short time. Meyer Chamberlain disagrees with Reinhardt as to the destruction of vitamines in all foods by prolonged boiling or cooking. "There can be no doubt," he says, "but that several combinations in the foods are now classed under the head of vitamines. These different vitamines are not equally susceptible to the in-

fluences of heat and perhaps of drying." The vitamine of milk is undoubtedly destroyed by boiling and impaired by pasteurization at say 145-160° F. However, other foods can withstand great heat as has been pointed out in previous articles: the cooking of ordinary rice, the boiling of peas or the baking of beans does not destroy their virility. For instance, raspberry juice can be cooked one hour without harm at 110° C., and lemon juice withstands heat which would harm cabbage. If foods are dried, then immediately utilized, their vitamines are not destroyed. As can be seen different foods must have individual vitamines. Casimir Funk has abstracted from rice needle-shaped colorless crystals with a boiling point at 233° C. or 451° F. Holst and Froelich were after arduous labor unable to determine the nature of the antiscorbutic bodies in fruits or vegetables either by dialysis, extraction or by other methods. Funk's theory that vitamines are a constant part of the nucleic acid present in the cells of food seems to be generally accepted. Another theory however that these bodies belong to the pyrimidine chemical bases but that they are destroyed by cooking (McCaskey) seems an insufficient one.

The *modus operandi* of these vitaminic bodies would seem to be the following: when taken into the body, cooked or uncooked in the hulls of rice, wheat and other food products, they are set free and presumably stimulate the secretions of the various glands such as the thymus, parathyroid and other internal glands. Thus through secretion of these glands nutrition is influenced, or they may act as hormones whose work is the activation and stimulation of enzymes. It remains to be determined at what temperature the several vitamines contained in the several foods are destroyed. The body lacking vitamines suffers from

intestinal disorders of varying description, and their absence leads to faulty nutrition, illness and death. Undoubtedly along with the vitamines the mineral salts in the food play a conspicuous part.

Peasants living on a diet of potatoes, cabbage and a little bacon are exempt from scurvy. "Such a diet," says Tibbles, "is often richer in vitamines than one containing a great abundance of protein, fat and carbohydrates." These vitamines are found in fruits, vegetables and cereals as well as in fresh meats, in the plasma or muscle juice; they are not due to the proteins therein contained, for the plasma contains very little nitrogen, only perhaps 0.4% or equal to 25 grammes of protein per kilo of muscle juice. The juices of fresh, underdone meats are, therefore, to be preferred as food.

Does not scurvy, therefore, mean the deficiency of some basic principle in our food or a deficiency of something within the body which certain fresh foods supply? Perhaps we may have an intestinal or other form of toxicity neutralized or rendered unimportant through certain chemical combinations in fresh foods. Does calcium and potassium enter into the chemical make-up of the vitamines? Schaumann believed scurvy to be a deficiency of organic phosphorus alone and clinical experience and experiments would tend to verify this theory in many respects. Also possibly different groups of organic phosphorus may serve different purposes in the organism (Tibbles) and their absence lead to different diseases (pellagra, beriberi, etc.). Finally then, if we believe in vitamines our prevailing ideas on restricted infant milk modifications, caloric feeding, and the like will essentially undergo an important transformation.

111 West 77th Street.

## INFUSIA DIABOLUS.

BY

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My thoughts turn to those comrades who were popularly denominated behind their backs, as "Sawbones," but to their faces were most courteously saluted as "Doctor," whenever we were in any little trouble needing help.

The surgeon's lot in the field is not a very happy one. Officers growl at him for excusing men from detail for duty. In the ranks he is cursed for not excusing. Every one is privileged to abuse him, but if the grumbler is bowled over by some of the mishaps of war, then indeed, how joyfully is "Doc" greeted.

Fatigue duty is not very popular, and various are the excuses given to obtain a remission from the detail. It is on these occasions that the sick call is answered by a numerous and interesting crowd.

To the credit of the profession of physic, it should be stated that it is seldom the surgeons allow themselves to be played upon by lazy bummers.

Have you ever met with the fanciful mixed fluid called "Infusia Diabolus?" I am indebted for my introduction to this remarkable tipple, which soon became popular with the medical officers of my brigade, to a Connecticut regiment.

At a sick call I was struck with the small number of invalids, and wondered greatly at the remarkable state of health, contrasting as it did, so favorably with that of my own regiment.

The cases as they came up, were evidently genuine ones, in which the surgeon had no difficulty in deciding that the men really required medicine and relief from duty, until the name of "Patrick Donovan" was called, the sergeant in charge stating that Pat was again at his old tricks, playing sick, shirking work, but regular at his meals.

*Doctor.* "Well Pat, is it the old trouble?"

*Pat.* "No, doctor dear, me indigestion is all right, but it's the rheumatism doubling

[We have been accorded the privilege of printing this delightful selection from General Molineux's Memoirs which the General's son, C. S. Molineux, has under preparation for early publication].

me up. I cannot stand straight, and it's worse when I double over to handle the shovel. All I want, doctor, is a little lotion, and to lie down on me back for a day or two."

*Doctor* (to the hospital steward). "Give Donovan a dose of Infusia."

*Pat.* "For the love of the saints, Doctor dear, don't make me take that broth of hell! Never mind me rheumatism, sergeant. I'll go wid the byes, an' do me best." And off he walked, *miraculously* cured.

The doctor kindly gave me the recipe, and offered a dose, which I declined until I could first try it on a private of my command. Here it is, as well as I recollect, with reasons why the materials are recommended.

#### INFUSIA DIABOLUS OR BUMMER'S INVIGORATOR.

Castor Oil .....	To make it pass off safely.
Asafoetida.....	To improve the odor.
Gum Arabic.....	To make it stick well.
Ipecac.....	To make it "back up" frequently.
Aloes.....	To improve the taste.
Senna.....	To give it a proper grip.
Rhubarb.....	To insure a realizing sense that it is constantly present.

The dose, *quantum suff.* Enough to make the patient desire to die. "There," said the doctor, "by exercising care as to whom to give the medicine, I find no one has ever applied for a second dose of this heavenly inspired elixir."

It was at once adopted in the volunteer service of the Empire State, to the delight of all true soldiers, and to the confusion of bummers and camp followers.

I have heard a rumor, improbable as it may appear, that a demijohn of whiskey once passed through a cavalry camp without losing a drop, because it was labeled "Infusia Diabolus."

**Gargle for Adults.**—For an astringent and antiseptic gargle Coble recommends:

- R. Ethyl alcohol, 3ij
- Cinnamon water, 3ij
- Formaldehyde, minim ij
- Glycerin, 3v
- Distilled water, q. s. ad. 3vij

—*Med. Record.*



**Beriberi from the Historical and Human Aspect.**—The discovery of the cause of beriberi, and the consequent conquest of perhaps, on the whole, the most devastating disease of the far East, is one of the most remarkable triumphs of modern medicine. Up to a few years ago the Japanese Navy was decimated by beriberi and the introduction by Takagi of dietary reform was the first practical application, on a large scale, of the knowledge gained of this disease by careful medical research.

Before commenting upon some of the investigations, the results of which have finally solved the mysteries of beriberi, it may be of interest to trace briefly the history of this scourge of Asia.

Beriberi is a disease of great antiquity. It is referred to as breaking out in the Roman Army when invading Arabia in the year 24 B. C. Chinese writers as early as the second century make allusion to it. According to MacGowan, the Neiching, the oldest medical treatise extant (B. C. 2697) refers to the malady, and it was fully discussed by an eminent author in 640 A. D. However, it ceased to prevail in China some two hundred years ago, and of late years its worst ravages have been confined to Japan, the Malay States and the Strait Settlements. Japanese works, up to the ninth century, comment on its frequency, although Professor Scheube of Tokio, is of the opinion that such references were taken largely from Chinese literature. From the evidence of contemporary writings he concluded that the disease appeared in Japan for the first time about the middle of the eighteenth century. It was so prevalent in that country in 1877 that 14 per cent., and in 1878, 35 per cent. of the men serving in the army suffered from it. The fact is somewhat curious that, while in earlier

European works dealing with tropical diseases, beriberi was distinctly recognized and up to a certain point accurately described, in more recent times the subject seems to have been comparatively neglected in medical literature and particularly in the English. As Manson says in Allbutt's *System of Medicine*, there were authors who were disposed to deny its existence as a specific disease, and to relegate it to the same category as anemia, malaria or rheumatism.

The recrudescence of the disease in Brazil in 1863, the opening up of Japan to foreign intercourse, and the discovery that the "kakke" of that country was none other than the beriberi of the Indies, the epidemics in the Singapore jail and in the prisons, mines and plantations of the Malay Peninsula Archipelago, and the ravages of the disease among the Dutch troops in Atcheen, have all drawn attention to beriberi and emphasized its gravity as a world problem. Incidentally, it may be mentioned that it was called "kakke" from the two Chinese words, kiaku meaning legs, and ke meaning disease. As pointed out in Allbutt's *System of Medicine*, the local names for beriberi are infinite. In Java it is known by the natives as Loempoe; in Banka as Pantjakit niloe, or siloe, (crystal sickness). In New Guinea as Pantjakit papoea; among the Malays as Kaki lem but (weak legs); in the French Antilles as Maladie des sucerries; in Cuba as Hinchazon (dropsy) de los negros y Chinos; in Brazil as Perneiras (ailing feet); in Matto-Grosso as Inchcão; in Ceylon, it was at one time known as the "bad sickness of Ceylon." As for the etymology of the word beriberi, Meyer-Ahrens derives it from the Hindustan beri, a sheep, in allusion to the peculiar gait in some instances of the disease. Plateeuw derives it from the Sudanese beriberi, beribit, berebet, stiff walking, pottering walking; Marshall from the Singhalese Bharyee, weak movement; Herklots from the Hindusta in Bharbari, swelling, edema, and Carter from the Arabic buhr, asthma and bahri, a sailor, in allusion to the fact that it is a form of dyspnea frequently met with among sailors in the Arabian seas. Simon says that during a visit paid to Ceylon, he definitely ascertained that "beriberi" is a Singhalese word which merely means,—"a very bad sickness." The history of the investigations leading to the discovery of the

cause and successful prevention of beriberi is one of the greatest of the many romances of medical research. Most persons regard medicine as the very antithesis of romance and especially that branch of it connected with research. When, however, it is considered that the results of many medical scientific discoveries have conferred untold benefits upon the human race, the romance of medicine will be brought home to the most unthinking. As a matter of fact the history of medical discoveries simply teems with romance, both from the point of view of the discoveries themselves and their effect on mankind. What events in the history of the world are at the same time more romantic and pathetic than the researches and discoveries of the immortal Pasteur! Broken by illness and grief and yet ever inspired by a patriotic flame that could not be quenched, he labored on, handicapped by physical disabilities, for the love and honor of his beloved France. And what a glory was his, albeit a pathetic, romantic tragedy! As previously said, the study of beriberi has been indeed a medical romance, and one of fascinating nature. For a long time, investigators were at a loss with respect to its true cause. Two main views, however, have prevailed. One of these, held by Manson until recently, was that it was an acute infection: the other is that it is a disease of metabolism. The acute infection theory has been exploded. Studies in the Far East have shown that it is due to a diet of rice from which the pericarp, or rather, the sub-pericarp, has been removed in the process known as polishing.

Braddon has pointed out that every patient suffering with beriberi in the Orient is a rice eater; that persons on a rice-free diet do not get beriberi; that the importation of machine-milled rice into any part of the world is followed by beriberi; that the users of home-milled rice do not get beriberi; and finally, that if from any cause, the home supply is exhausted, beriberi will break out on the importation of machine-milled rice. The association of rice and beriberi is comparatively an old story; the Dutch knew of this long ago, but it was left to Fraser and Stanton chiefly to drive home the fact that the grain of rice deprived of its outer husk was likewise deprived of an essential nutritive element. Those using rice machine-milled or polished as a staple diet, have

long been known as very prone to suffer from beriberi. Funk went further and gave the name of "vitamine" to the anti-neuritic element in rice and proved that animals fed solely on polished rice developed polyneuritis. Crowell and Strong obtained almost identical results from similar experiments on criminals condemned to death. But after all, the most convincing justification of the polished rice theory of the causation of beriberi lies in the fact that it has been eradicated from the Japanese Navy by judicious dieting, and furthermore that in practically all localities in which whole rice has been substituted for polished rice, the disease has been stamped out. The results of the investigations of research workers, such as Scheube, Fraser and Stanton in the Far East have been a romance and a triumph. The romance has consisted in these men taking upon themselves the white man's burden in a tropical country, and living a laborious life with little or no hope of material profit, but for the good of their fellow men of an alien race. The triumph has been that they have succeeded in their object of saving life and prevented untold misery. Like Pasteur, they have raised to themselves a monument more lasting than marble or bronze in that they will be enshrined in the hearts of the dwellers of the Far East for ages to come. From the human standpoint, the work of those investigators who have studied beriberi represents one of the great conquests over disease.

**Bread, the Indispensable.**—In all periods of the world's history, civilized people have considered bread one of their most

important articles of diet. During the 18th century a loaf of bread was discovered in an oven by members of an expedition excavating in the ruins of the city of Herculaneum. The loaf still bore the official stamp, thus not only showing that it was made during the reign of Emperor Trajan, but also indicating the importance that was attached to bread by the empire. All through the middle ages baking was kept under strict



supervision, and in some countries of Europe laws pertaining thereto were rigidly enforced until quite recently. In some parts of Italy and France in the 18th century the people were supplied with bread baked in a common or community oven, which was kept under the control and supervision of the government, thus insuring to the consumer not only good bread, but at a reasonable price. In early times, there was a drastic law in Persia providing that if a baker deceived the people by selling short weight or an inferior quality of bread, he should be baked in his own oven. The historian recording this law evidently had a high appreciation of the importance of good bread, for he naively states "few will think such a punishment too cruel—considering the enormity of the crime!" For some time many governments have carefully supervised the making of bread, especially since the breaking out of the great European war. In fact, the bread problem in some of the belligerent countries, Germany and Austria particularly, has become very serious, for white bread has largely disappeared and the people have been forced to use a special "kriegsbrot" or the old time black bread of the peasants. How great a cross this must be to people already sorely afflicted can only be partly imagined by those of us who have never had to undergo such deprivation.

To consider bread from the standpoint of public health, it is evident that this food staple should possess the highest possible nutritive value. Investigations made by the U. S. Public Health Service (*Bulletin No. 333, April 14, 1916*), particularly in regard to bread in relation to the production of pellagra, are especially interesting inasmuch as this line of research bids fair to develop a large amount of practical information bearing on human nutrition in general.

For a long time bread was prepared from wheat flour, or cornmeal with salt, and with or without other ingredients, such as fresh milk, buttermilk, molasses, etc. The wheat flour or cornmeal was made by crushing the whole grain between stones, or by various other means, to the desired degree of fineness. This flour was sifted to rid it of the coarser particles of bran. Accordingly the bread contained practically all of the nutritive elements of the whole grain. During the last 50 years, however, radical changes have

taken place with the evolution of new methods, most of which unfortunately have had a tendency to reduce considerably the nutritive value of bread. The causes of these changes have been many and various, but all have been more or less closely connected with the progress made in our social and economic life.

The increase in the price of labor as well as the demand for flour or meal brought about the invention of a device for the more economic milling of these cereals, the roller mill system which came into use in 1878. This process made it possible to separate the several parts of the grain; the germ, the bran and the endosperm or starchy part. This allowed the latter to be ground to a fine flour which because of its whiteness appealed to the housewife as a purer product. The germ and bran were largely discarded as human food, and sold as fodder for cattle, horses and hogs. This new flour has undoubtedly kept better than that made by the old process; the new method employed in its preparation, however, deprives it of valuable food constituents. Thus it contains less protein, fat and ash, but what is even more important, it is markedly deficient in certain so-called accessory food substances,—the so-called vitamines which are contained in the intact kernel, the outer layers (aleurone layer) and probably in the germ. In other words, wheat flour, corn flour, hominy and grits, minus the bran and germ, are lacking in vitamines, while whole wheat flour and cornmeal contain practically all the vitamines of the whole grain.

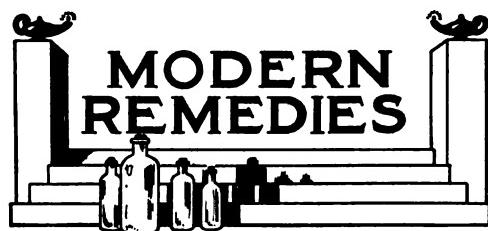
But with the introduction of this new flour it developed that when mixed with salt and water and used according to the old methods, it did not yield a light bread. Housekeepers, therefore, resorted to artificial leavening by adding baking soda or sodium bicarbonate. Bread made in this manner has under certain conditions a distinctly alkaline taste and reaction. The high temperature liberates carbon dioxide ( $\text{CO}_2$ ) from the sodium bicarbonate and the last mentioned is converted into sodium carbonate, a strong alkali. This change causes the bread to rise and makes it light and porous. Vitamines, however, lose their physiological activity when exposed to alkalies, especially at high temperatures. Hence in making bread too great care cannot be used to avoid excessive alkalinization.

Thanks to the masterly researches of Funk, the importance of vitamines in the maintaining of bodily nutrition is being realized as never before. Especially has the relation of the vitamines to bread making attracted attention, for as before stated, it is easy by improper methods to destroy these vital elements so essential to good nutrition.

In fact there are excellent grounds for believing that a good deal of the white bread made in our homes, as well as in the bakeries, is, owing to faulty methods of making not only often valueless, but many times positively harmful. Much careful investigation remains to be done but if the vitamines are absent from bread as a consequence of the foregoing, it is reasonable to believe that one need go no further to find the cause of many of the derangements of nutrition from which so many people suffer at the present day. Under these circumstances "the staff of life" becomes "a broken reed" indeed.

With bread filling so important a place therefore in our every day dietary, and its deficiencies apparently responsible for a considerable proportion of human ills, there would seem to be no subject more deserving of intelligent painstaking attention than the making of our daily bread. The Department of Agriculture, as previously stated, has given more or less attention to the problem and issued some valuable literature. But the whole proposition is so important in the light of recent discoveries, that a comprehensive campaign should be undertaken looking to the education of the people the country over concerning bread and its proper manufacture. The schools can effectively supplement the work of the national government, and these as well as every other agency should be utilized to insure that the best bread possible to obtain is made in our homes. Good as much of our home-made bread unquestionably is, it is a proven fact that a good deal of it is decidedly poor, not only from the edible standpoint, but also from the nutritional. As for the bakers, the necessity is both educational and legislative. Probably on the whole, the bakers' bread of the country will compare very favorably with that made in our homes. But there is still much room for improvement, and to this end a systematic effort should be made by the government to teach the bakers how to make bread of better and more uniform

quality. Definite standards should be established and thorough care given to their maintenance. The bakers should be instructed particularly in regard to the importance of preserving the vitamine content, or whatever the qualities are that make bread a real nutrient instead of a potent factor in the lowering of human vitality and the impairment of human efficiency. And if bakers are caught putting out bread that is substandard, and by reason of its lack of vital principles, a handicap to its users —let the punishment fit the crime. Public opinion would probably discountenance the old Persian custom we have mentioned of baking the offender in his own oven, but he should at least be punished to the extent of being forced to eat his own product. And if bread of inferior quality is as disastrous to bodily nutrition as recent investigations seem to indicate the baker forced to eat his own baking, will soon by his physical condition provide a warning against the product of his ovens that no one will be apt to misunderstand.



Conducted under the Editorial Direction of  
Dr. John W. Wainwright.

**Chloral in Cardiovascular Affections.**—Martinet (*Presse Medicale*, June 5, 1916), calls attention to the warning given in numerous text books against the use of chloral (formerly chloral hydrate) in cardiovascular disorders, which has done harm by preventing the use of this agent for hypotensive purposes, for which it is more efficacious and less injurious than the nitrates. Depression of the myocardium does not occur, he declares, until enough has been given to dangerously depress the respiratory centers and those that regulate the heart. Daily doses of twenty-eight grains of chloral have in a number of instances been given to tetanus patients without harm to the circulation. The chronic toxic effects of chloral are exerted

chiefly on the nervous centers, including especially the vasomotor centers, but to no special extent on the heart. Clinically, chloral combined with bromides is one of the best agents for the general relief of general and circulatory spasm. While chloral is indicated in conditions of neurocardiovascular, hypotension with insomnia, high blood pressure and oliguria, it is contraindicated in neurocardiovascular asthenia, low pressure, and somnolence with or without reduced urinary output.

**Scarlet Red in the Treatment of Peptic Ulcer.**—Friedenwald and Leitz (*Medical Record*, July 22, 1916) conclude after an experience in treatment of 45 cases of peptic ulcer with scarlet red, that it still remains a useful adjuvant in the treatment of this condition, and while it cannot replace the usual forms of treatment, when administered in conjunction with them, it adds materially to the effectiveness of the cure. It is of great help when given in ambulatory cases, the effect being even more favorable than the usual remedies, such as bismuth. Inasmuch as scarlet red in no way interferes with the administration of the other remedies, the alkalies or atropin, these may be given when indicated at the same time, and, in fact, the effect of the combination is at times most beneficial.

In tabulating their cases, the authors show 29 cases of duodenal ulcer and 16 cases of gastric ulcer. Of the series 31 were cured, 8 relieved and 6 not relieved. Sixteen were treated by the Leube rest cure, 18 by the Lenhardt treatment and 11 were ambulatory cases to all of whom scarlet red were given in doses ranging from 30 to 60 grains per day.

**Colloidal Sulphur in Acute and Chronic Rheumatism.**—Massalongo and Viraldi, (*Riforma Medica*, July 16, 1916) report the treatment of thirteen cases by intravenous injection of colloidal sulphur. This method of treatment caused short chills, followed by fever which quickly subsided with profuse sweating. Immediate and marked improvement in general health was noted as was rapid diminution of pain and shorten-

ing of the morbid process. The authors counsel its use in young and robust patients without visceral complications, when salicylic treatment has been without avail.

It would seem that this action in rheumatism is produced by thermic elevation and consequent intense diaphoresis.

**Infected Suppurating Wounds.**—Morrison (*The London Lancet*, August 12, 1916) reports his experience in the treatment of infected wounds of the wounded in the present European war.

He first administers an anesthetic and then covers the wound with gauze wrung out of a solution of phenol 1 to 20. The wound is then freely laid open and the cavity cleansed with dry sterile gauze. The surface of the cavity is then washed with methylated spirit, and the whole cavity of the wound filled with a mixture of bismuth subnitrate 1 oz., iodoform 2 oz., and liquid paraffin to make a thick paste or ointment. This is covered with sterile gauze and an absorbent pad. This dressing will not need to be changed for days or even weeks. Iodoform poisoning symptoms were rarely noted, while the results had been excellent.

**Digitalis and Physostigmine as Hypotensive Remedies.**—Danielopolu (*Presse Medicale*, June 5, 1916) states that prolonged observations in thirty-two cases had convinced him that digitalis never raises but often lowers the blood pressure. Its hypotensive action seems to be more marked if a suitable dose of physostigmine had been previously given.

**Caution with Drug Addicts.**—The reduction of a drug addiction below the amount of the body need robs the addict says McMechan of his most valuable asset in securing and maintaining recuperative powers.

**Calendula a Germicide.**—Gregory (*New York Medical Journal*, July 8, 1916) reports on this agent as a germicide. He declares that it has stood the test for years and that it is absolutely sure death to all pus germs. Caution is given that there are preparations on the market almost worth-

less. The fluid extract, the form used, is concentrated to almost the consistence of syrup. Gregory has found calendula useful in erysipelas in combination with lead acetate and a saturated solution of boric acid. In leucorrhea, a nonalcoholic calendula and glycerine are exceedingly efficient. Burns dressed with calendula and a saturated solution of boric acid will remain perfectly clean and sterile till healing is compete.

**Quinine and Urea for Hemorrhoids.**—Terrell (*Medical Brief*, Oct., 1916) records the cure of hemorrhoids in a series of 127 cases, by injecting a solution of quinine and urea of from 5 to 20 per cent., strength. In two years use of this agent Terrell treated as above 127 cases with only one recognized failure. He declares this treatment safe, simple and efficient, and that it produces starvation and atrophy of the hemorrhoidal mass. It was used only in uncomplicated cases of internal hemorrhoids.

**New Uses for Rubber in Surgery.**—Saint Martin (*Presse Medicale*, July 13, 1916) describes cases of nerve injury, where pieces of rubber tubing were passed around nerves freed in operation from compression by fibrous or other tissues, in order to keep the nerves isolated from surrounding structures. Either the radial or ulnar nerves were involved. The rubber was still in use two to four months after operation. Another case is cited where a small rubber ball shaped like a human testicle was substituted for the loss by operation of an injured testicle without the patient's knowledge. This substitute was perfectly borne and the patient remained free from concern resulting from his injury.

**Alkalies in the Treatment of Pellagra.**—In the *Texas Medical Journal* (Aug., 1916) Perdue expresses the opinion that pellagra can be prevented by the drinking of water containing a sufficient quantity of the bicarbonates of calcium and magnesium; and can be cured by the simple administration of suitable alkaline carbonate or an organic alkali convertible into a carbonate.

**The Internal Secretions in Relation to Body Functions.**—It is only within comparatively recent years that our knowledge of the function of the ductless glands and their internal secretions has assumed anything like exactitude. In fact, says Bainbridge (*Illinois Med. Jour.*, Nov., 1916) it was not until Brown-Sequard, experimenting with testicular extracts, which he administered to himself and some of his co-workers, gave the cue that the theory of the existence and function of the internal secretions was put to the test of practical application. By the administration of the extracts of certain glands, it was found that the function of the corresponding glands in the individual to whom the extract was given was stimulated to greater or to more nearly normal action. From these experiments has been evolved one of the most promising theories as to the fundamental cause of an important class of maladies.

So important is the rôle attributed to the internal secretions in the normal exercise of body functions, that some observers have gone so far as to hold that so long as these secretions are generated properly and exercise their regulatory function in normal fashion, all is well with the physical health. When, however, through the abnormal conditions that arise in consequence of defective drainage throughout the body, or as the result of other conditions not determined, the internal secretions are in any way interfered with, the machinery of the body is more or less vitally hindered.

It may be that the evil influences, whatever they are, that interfere with the output of these secretions are conducive to too great a flow of these mysterious fluids; if so, then we have a hyperactivity of certain functions over which the given gland of internal secretion is supposed to exercise its regulatory function. An illustration of the

outcome of this state of affairs is seen in exophthalmic goiter, or Graves' disease—systemic goiter, as the writer calls it—with the bulging eyes, in some cases the enlarged thyroid gland in the neck, the rapid heart beat, the shortness of breath, and the general distressing symptom-complex of this affection.

On the other hand, if too little of the secretion of the thyroid gland is the result of the interference with its function, we have a hypoactivity of certain process, leading to many distressing physical and mental abnormalities, such as excessive fat, congenital idiocy or cretinism, and a number of unfortunate and previously unexplained below-par conditions.

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**The Use of Hepatic Extract in Liver Disorders.**—For some time liver extract has been used in Europe and several observers speak highly of its efficiency in certain liver disorders. Hepatic extract has also been employed in functional disturbances of the liver, says Cobb (*Med. Press and Circular*, Oct. 18, 1916) especially in those cases not always recognized in textbooks of medicine, but which are very well known in practice, and to which we may refer as "congestion of the liver," "hepatic inactivity," or "hepatic insufficiency." We may assume that in such cases—and it must be emphasized that we are referring only to functional disturbances of this organ—for some reason the secretion of the hepatic cells (not only the bile) is deficient, and that possibly not only is the conversion of the products of digestion incomplete, but that the filter function of this organ is deficient. It used to be supposed that the symptoms of a "congested liver" owed their presence to bile in the blood-stream; but in

the light of recent work it is much more probable that other and more complicated processes are responsible.

Extracts of liver have been prescribed in such cases, much along the same lines that other glandular extracts have been prescribed in diseases in which we seek to increase glandular activity—that is to say, with a view to stimulating the production of the necessary secretions, and to preventing the appearance of the symptoms which we know must appear if the absence of the secretion concerned is allowed to persist. But this is only one example of the uses to which these extracts have been put. Hepatic cirrhosis has been treated by the administration of liver extract, and, more especially in the atrophic variety, has met with some degree of success.

It has been stated that such administration has a marked action upon nutrition, and assists the urinary excretion, and that favorable results have followed its use in cirrhosis of the liver, as well as in functional congestion, and even in cancer. It is only rational to assume that, provided it can reach its goal without being destroyed on the journey, it will have the power either to replace normal secretion, or to stimulate that part of the secreting mechanism of the organ which has not been destroyed. That it must have some action in replacing the deficiency has been shown by those observers who have demonstrated that the changes in excretion alone have been marked after the use of these extracts. Thus they have shown that the urea index is markedly increased as well as the total quantity of urine; that anasarca has diminished, and that the tendency to hemorrhages, which is common in cirrhosis, has been lessened.

Again, its use has been recommended in cases of hepatic diabetes, and where the diagnosis has been accurately made, its employment should do good. As another use in this connection, Harrower suggests that a good plan to adopt when diagnosing the nature of diabetes is to commence treatment with pancreatic preparations and to administer these for one month, and then if no favorable result be obtained to try liver preparations. He goes on to emphasize that the form of diabetes associated with liver disturbances has peculiar characteristics, notably that the glycosuria occurs at

definite times, as after a meal or in the evenings; that the major symptoms of the complaint, such as thirst and polyuria, are not so marked, but that the tendency to infection and gangrene is well seen. From this he infers that the liver is failing in its antibacterial powers. It is in these cases, according to this author, that hepatic extracts are useful.

It will be quite obvious that in so far as the treatment of diabetes by liver extracts is concerned, diagnosis is the essential point; and that whatever reliance be placed upon ootherapy, general medicinal treatment should be insisted upon. For, as we have said elsewhere, the more we learn about this important subject the more are we impressed with the fact that diet, so as to spare in so far as is possible strain upon the organs concerned with sugar metabolism, is the first and most important point.

The dose of liver extract is variable, but most authorities are agreed that it should be administered in generous and regular doses. It is said that extract of this organ, administered orally or per rectum, is practically non-toxic, and that it may be given in doses ranging from 15 or 20 grains of the dried extract, given every hour, and increased to as much as 60 grains three or four times daily.

#### Pancreatic Organotherapy in Epilepsy.

—So numerous are the "cures" recommended in the treatment of epilepsy that a bare statement to the effect that pancreatin is successfully used in this disease would carry little weight without some preliminary comment. However, pancreatin is the most recent remedy to be recommended in epilepsy:

Cotton, Corson-White and Stevenson working at the New Jersey State Hospital, have studied many cases of epilepsy. Their facilities are of the best and the equipment ideal for such an investigation. A modification of the Abderhalden reaction, similar to that worked out by Ludlum and Corson-White in the differential diagnosis of the endocrine disorders in insanity, and briefly referred to in this department (A.M. MED., Mar., 1916, p. 193) was used as a guide to medication; and the subjoined preliminary conclusions have far greater weight than if they had been drawn from every-day

clinical experiences without the checking of the laboratory and the advantages of study in a large institution.

The deductions seem reasonable, the physiology correct, and the results reported make this treatment of considerable prospective interest to all who have to deal with epilepsy.

"At least one type of epilepsy is probably a disease process dependent upon absorption of toxic or poisonous products from the intestinal canal.

"This stasis may be produced by an over-action of the suprarenal glands.

"Hyperactivity of the suprarenales may be caused by : (a) dysfunction of the pituitary; (b) dysfunction of the pancreas; (c) irritation of the duodenum; (d) severe fright or emotional disturbance.

"Treatment by administration of pancreatin should be employed in preference to surgical procedures."

The dosage recommended was one-half a grain of extract of pancreas three times a day—a very small amount, but evidently enough to be noticeably helpful, for "many patients while taking the pancreatin did not have convulsions. In some when the gland was stopped the convulsions returned. In others no convulsions have occurred after discontinuing the gland . . . . the administration of pancreatin has had a decided effect in stopping the convulsions."

The explanation of this action is that pancreas organotherapy serves in some slight measure, at least, to inhibit adrenal activity. These writers also believe that it is an aid to digestion, facilitating the quicker emptying of the duodenum and the proteins are more rapidly broken down into less toxic end substances.

It should be remarked that these clinical experiences with numerous patients (69 cases were studied by these writers) not merely direct attention to the possibilities of another treatment of epilepsy, but they also serve to establish the fact, denied by not a few, that pancreatin when administered by mouth is not destroyed and therapeutically useless.

course and details in a case of disturbance of impulse production, auriculoventricular automatism, with pronounced bradycardia—pulse 42—all evidently traceable to irritation of the vagus nervous system. The data presented demonstrates that this irritable condition of the vagus is the result of the normal thyroid secretion. The thyroid functioning was at a very low ebb, and the heart disturbance could be corrected at will by injecting treatment. The patient was a woman of 42 who had long had an apparently ordinary goiter, and complained of loss of hair and menorrhagia. Sakai says that he knows of no analogous case on record in which impaired functioning of the thyroid was responsible for abnormal impulse production of this type in the heart.

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**The Relation of the Thyroid to Galactogenesis.**—Several items have appeared in these columns regarding the relation of certain of the glands of internal secretion to the production of milk.<sup>1</sup> Attention has also been called to the importance of the thyroid gland during and following pregnancy.<sup>2</sup> Some interesting remarks in this connection appear in a consideration of thyroid insufficiency during maternal nursing by Laureati (*Pediatria*, July, 1916, p. 411) from which some clinical experience of much prospective value may be taken.

Laureati believes that infants generally suffer from a fairly well defined thyroid insufficiency in the early weeks or months, and that this usual lack of the thyroid internal secretion is supplied through the mother's milk. If, then, the mother is also suffering from hypothyroidism one can expect to find more or less serious results in the child. This has received clinical confirmation a number of times by supplanting the mother with a wet nurse, whereupon considerable gains in growth and development were initiated.

A number of clinical experiences convinced Laureati that maternal thyroid insufficiency is an important factor in the causation of numerous nutritional disturbances in nursing infants, and has found that

<sup>1</sup> See especially "Organotherapy Galactagogues," AMER. MED., Mar., 1916, p. 196.

<sup>2</sup> "The Thyroid during Pregnancy," AMER. MED., June, 1916, p. 465.

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**Bradycardia of Thyroid Origin.**—Sakai, quoted in *Kentucky Med. Jour.*, Nov., 1916, gives several charts and tables to show the

thyroid feeding to the mother under such circumstances is of decided therapeutic value to the mother and child.

To lend emphasis to his position, Laureati quotes from Concetti, who noticed that thyroidectomized goats were unable to suckle their young sufficiently, but under thyroid treatment they produced more milk, which, with the discontinuance of the medication again became insufficient.

With these experiences in mind, the pediatrician will likely consider more carefully the condition of the thyroid in nursing mothers, and numerous clinical examples similar to those reported by Laureati doubtless will be encountered.

Another point in this paper is worth repeating: Thyroid treatment is not only useful in warding off and curing syndromes resulting from thyroid insufficiency; but it also "serves as a touchstone to reveal the true cause of abnormal development in nurslings" and proves the direct dependence of such conditions upon abnormalities of the internal secretion of the thyroid gland in nursing women.

In this manner ductless glandular instability in the very young in some slight measure may be obviated; and the whole subject of the organotherapeutic treatment of nursing mothers with the expectation of influencing the child through the changed hormone content of the milk may revolutionize still another phase of clinical practice, just as the advent of pituitrin has revolutionized certain phases of obstetrical practice, or the usual administration of thyroid has revolutionized the treatment of the major thyroid diseases.

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**Thymus Extract in the Treatment of Chorea.**—In his consideration of the etiology of chorea minor, Haneborg (*Norsk mag. f. Laegevidenskab.*, Aug., 1916, p. 1040) makes some interesting remarks which connect the thymus gland with this disease. After mentioning that chorea is essentially a disease of childhood Haneborg reminds us that the chorea age is from 2 to 10 years, which also happens to be the period when the thymus gland is gradually retrogressing. He suggests that perhaps chorea may have something to do with a disordered thymus function.

The question is asked: Does the thymus contain substances which exert a tranquilizing effect upon the nervous system, so that any deficiency in the production of its internal secretion in the young may leave the nervous system free to act abnormally? It is not unreasonable to expect that the usually accepted causative factor in chorea—acute rheumatism—may influence the thymus and as a result of hypothyroidism, the already unstable nervous organism of the child "may feel the lack of the normal restraining influence of the thymus."

From a purely clinical standpoint it has been stated that a course of thymus medication seems to exert a sedative influence upon the nervous system. Haneborg himself states that he has given it with good effect in the control of convulsions. He reports the experiences of one of his colleagues who has been giving thymus systematically with decided benefit to patients suffering from exophthalmic goiter. (A number of reports in French and British literature supplement the position taken by Haneborg's associate; in this country, Solis Cohen once stated that he made frequent use of thymus therapy in hyperthyroidism with good results).

Haneborg continues by referring to the case of a congenital idiot who for years had had fifteen to thirty convulsive seizures a day, resistant to all treatment until thymus medication was instituted for a period. The anti-convulsive influence of this organotherapeutic remedy was evident, and it occurred to Haneborg that the same influence might be available in the treatment of chorea. So he began giving thymus to a number of choreics with most satisfactory results, and frequently the initiation of this form of treatment caused "an abrupt turn for the better." In one case the choreic movements returned a week after the thymus extract was suspended, but it subsided anew when the treatment was begun again.

The method of treatment suggested consists in giving three to six 5-grain tablets of thymus gland daily, a child of ten receiving from 20 to 25 grains daily. If rheumatic pains and fever are present, the salicylates are given during the first two days of treatment. The thymus is continued until the choreic movements are controlled.

This seems to be a new and compara-

tively untried organo-therapeutic measure, and since thymus extract is practically non-toxic—the recommended dose in adults is from 15 to 45 grains three times a day—no harm should follow the attempt to substantiate the findings outlined above.

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**Prophylaxis of Endocrine Disorders in the New-born.**—An important address by Sajous appeared in the *New York Medical Journal* (Apr. 1, 1916; p. 625) entitled "Our Duty to Mental Defectives of the Present Generation." It is one of the most important communications on the internal secretions and organotherapy which has appeared for some time, and among a number of weighty matters embodied in this article the most important concerns our duty to the coming generation, rather than to the present one.

Sajous enunciates a principle which we believe is destined to become more and more appreciated as its importance dawns upon the profession: "The main underlying cause of defective mentality in both parent and offspring is inherited deficient activity of the ductless glands . . . . We should start a campaign having in view the salvation of these unfortunate infants by supplying, through the intermediary of their defective mothers, and, after birth, through their food, the secretions they lack to complete their development."

Many facts are gathered in this paper to emphasize the correctness of this view; and they are not merely drawn from clinical experience but from extensive laboratory investigation with animals.

Preventive or prophylactic organotherapy is destined to become an important phase of this ever enlarging subject; and the prospects of results such as these will sharpen the eye of the general practitioner to perceive the earliest manifestations of endocrine insufficiency in pregnant women. As Sajous well says: "Whenever the father or mother is a mental defective, or both parents show any sign of deficient activity of one or more ductless glands, or are mental defectives, organotherapy should be instituted as soon as pregnancy is recognized. . . . The pregnant mother having

been carefully treated organo-therapeutically according to the stigmata she presents, the infant will be supplied *in utero* with the secretions required to build up, not only its nervous elements, but also its osseous, muscular, cardiovascular, cutaneous and other systems. It will also be prepared to develop normally after birth, provided that the treatment is continued. This may be done either through the maternal milk or, if the infant is fed artificially, by adding the organic agents to its milk."

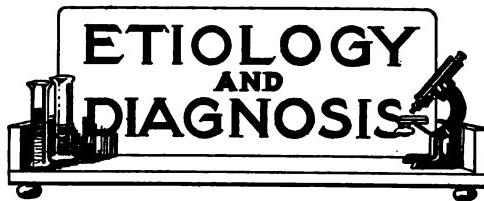
Importance is laid on the hormone content of breast milk. Sajous remarks: "The milk of the normal woman does more than feed her sucking; it is now known to protect the infant against infection by means of ferment which correspond, in their physico-chemical properties, with those of the ductless glands found in the blood and in the phagocytes. In a mentally defective woman, however, the probability (shown by autopsies) that one or more glands may be defective, gives her milk a doubtful character; hence the need of continuing to use organic products."

This is quite in harmony with an item in the Italian journal *Pediatria* which was published almost simultaneously with Dr. Sajous' address. It is considered in another column; and no greater and more practically useful subject could be brought to the attention of our readers. It is prophesied that as our knowledge of prophylactic organotherapy is given much more frequent application in the numerous available opportunities, much encouraging progress will result; and who knows but that this may be "the way out" of the greatest problem of the eugenists?

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**Pituitary Extract in Obstetrics.**—A case of rupture of the uterus following the use of pituitary extract in labor is reported by McNeile (*Am. Jour. of Obstet.*, Sept., 1916). After giving details of the case, he states the following conclusions concerning the proper and safe use of this agent in labor, basing his conclusions upon results of studies and experiences in the Los Angeles County Hospital. The conditions named are that the cervix should, must in

fact be completely taken up and dilated, the membranes ruptured, presentation longitudinal. In cephalic presentation there should be no deflection of the head; while pituitrin should be used only in vertex and breech presentations. There must be no pelvic disproportion and the presenting part must be completely engaged.



**Some Principles of Investigation in Blood-Pressure Problems in Health and Disease.**—McQueen in the *British Med. Jour.* (Sept. 23, 1916), deplores the lack of method shown by some clinicians in the choice and arrangements of their observations on blood pressure. He points out that the feature to be studied in the circulation in health and disease is the power of the heart in conjunction with changes in the peripheral blood field to adapt itself quickly and efficiently to extra strain. If a satisfactory knowledge of the heart and peripheral circulatory system in the human subject in health and disease is to be gained it is necessary to examine and record the changes in the systolic, in diastolic, in pulse pressure range, rate of heart beat, and rate of respiratory rhythm during the strain thrown on the heart by exercise, not after it is over. The systolic pressure can be estimated during exercise either by the auditory or the tactile index, but the diastolic index is estimated by the auditory index alone. Consequently it is best to adhere to the auditory index for both measurements. In making the examinations the subject is placed on his back on a polished table and the exercise consists in rhythmically drawing up his feet and legs as in swimming on the back. The mildness of this exercise depends upon the length of time it is kept up. It is also possible to examine the circulatory phenomena during exercise in the erect posture by the auditory method, the exercise employed being that of working a silent lathe with one foot. By these methods it is found that the ranges of blood pressure, both systolic and diastolic, in both healthy and unhealthy subjects vary greatly. It is obvious that the response to a given amount of work of normal adults with a blood pressure, say of 130 systolic and 75 diastolic, and a rate of heart beat, say 78, should be investigated. The author believes that in cases with departures from the normal by testing them against the performance of a given amount of work we may be able to solve some of the problems as to how nature adapts both the heart and the peripheral

circulation so as to overcome initial defects. Until we know the significance of various levels of pressure, systolic and diastolic, with various rates of heart beat, and respiratory rhythm, a mere chronicling of measurements in countless clinical lectures is without significance.

**The Clinical Manifestations of Beriberi.**—Doyle discusses beriberi (*New York Med. Jour.*, Apr. 8, 1916), as encountered in the quarantine hospital maintained by the Health Officers' Department of the Port of New York on Hoffman Island under the administration of the late Dr. J. J. O'Connell. Thus he points out that beriberi may begin slowly or suddenly. When it begins slowly, which is usual, it is preceded by malaise, girdle pains, increasing constipation, and slowly advancing edema of the legs and face. In the rapid form the disease may become full blown over night, the patient retiring apparently in a healthy condition and finding in the morning that he has become dropsical or paretic. The progress of the disease is equally uncertain, as some of the cases observed by Doyle became malignant in character after the disease had existed for several weeks apparently in a mild form.

The same may be said about the duration of the disease. It may subside in a week or continue for months. In the mild cases the rapidity with which the heart resumes its normal condition is remarkable. A dilated heart in one of the author's cases cleared up completely in less than a week.

The temperature in every case of beriberi during the past year has been subnormal upon admission to the hospital, usually reaching normal and remaining so after two days.

All cardiac attacks come on suddenly, especially in the paraplegic stage of the disease. On making rounds in the wards, Doyle states that he has examined the hearts of patients one after another and has had to hurry back to a patient examined ten minutes before, who was having a cardiac attack and was practically *in extremis*, although his heart was normal at the time of examination.

Relapses, although not of common occurrence, are more often found in those cases where the patient is used to drinking large quantities of alcohol. One of the Hindoo patients under Doyle's observation, who had evidently acquired a taste for Calcutta whiskey, was admitted to the hospital with the paraplegic form of dry beriberi, and had fully recovered the use of his limbs when he had a relapse, and the wet form of the disease developed with all the paraplegic symptoms. Cases of beriberi with cardiac involvement are in need of constant attention, according to Doyle, especially the paraplegic form, as it is his belief that in these cases the mortality may range as high as fifty per cent, while in those of other forms the mortality is as low as two per cent.

The diagnosis is not difficult when rheumatic pains, pretibial edema and analgesia are present, and the case is known to come from the tropics where true rheumatism is rare. In all

such cases the knee jerks should be tested and all signs of hyperesthesia of the calf muscles sought for, before making a diagnosis.



**Gunshot Fractures of the Femur.**—Grooves in his interesting article in the *British Jour. of Surg.* (Apr., 1916), says the essential principles of treatment are as follows:

1. *Immobilization of the limb.*
2. *Dressing without movement.*
3. *Extension of the broken bone sufficient to secure correct alignment and full length.*
4. *Thorough cleansing and draining of infected wounds,* with provision for free or continuous irrigation.
5. *Semiflexion of the joints above and below the broken bone,* to relieve the tension of the great flexors and to place the limb in a position of physiological rest.
6. *Freedom of the uninjured parts of the limb and joints,* to insure that massage and movements may be carried out from the earliest possible moment.

The danger of doing too much in the treatment of infected wounds associated with gunshot fractures consists in the unwarranted removal of pieces of bone. Fragments should never be removed from a fracture unless they are certainly dead or non-viable; often in the early stages this can only be ascertained by pulling the bit of bone out to demonstrate the absence of vascular supply. As a matter of fact, however much the bone has been comminuted, its constituent fragments are very seldom without vascular connections. This is easily demonstrated by dissection of limbs which have been amputated at an early period for gangrene. If a bit of bone is clearly lying loose in the tissues it is better removed from an infected wound; I do not believe there is any justification for the retention, still less for the replacement, of such a fragment in its septic bed. But this is a very different thing from exploring the wounds with fingers and forceps, and pulling out all the bone which can easily be removed. Such a practice leads to a flail-like limb which nothing can restore to usefulness except a difficult operation of late grafting. The general rule should be never to remove bone from a septic fracture until a late period, and then only when it is clearly dead.

**Treatment of Furunculosis.**—This is both operative and medical says a writer in a recent issue of the *Berliner klinische Wochenschrift*, and is followed according to the method of

Unna: The operator first notes the set of the hair around which the boil is situated; then the skin covering the boil is gently squeezed until a bloodless white area is presented, which is the bacterial focus. With a darning needle sterilized to dull red heat this central white area is punctured to 3 or 4 m. m. in depth, care being taken to follow the direction of the hair. This plan of procedure immediately removes the focal area and gives instant relief of tension and pain. If such is not the result the operation has not been performed correctly. Any one of the following pastes may be used as a dressing:

R Kaolin (Fuller's earth) .....	20
Glycerin .....	10
Ichthyl .....	5

After this has been applied the surface should be covered with some impervious material such as guttapercha paper. Another paste which hastens healing is:

R Sulphur .....	10
Oxide of zinc .....	10
Chalk .....	10
Glycerin .....	30

When no inflammation or irritation of skin is present the formula may be changed to: 10 parts each of sulphur, oxide of zinc, chalk, oil of turpentine, and vaseline. Axillary boils, while not as painful as those around the back of the neck, are more troublesome on account of the tendency to return. Unna states that in the beginning stages these abscesses may be opened with a small cautery, but that later the skin in the axillary region should be shaved and each small abscess opened by tiny incisions, after which the armpit should be dressed with

R Mercurial ointment .....	25
Oil of turpentine .....	5

Lead plaster .....	20
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This again should be covered with gutta-percha paper, which remains *in situ* without any bandage.

**The Problem of Ringworm in Children.**—Oliver, in the *Boston Med. and Surg. Jour.* (May 25, 1916), reaches these conclusions:

1. Ringworm of the scalp is a highly contagious disease.
2. The older methods of treating ringworm of the scalp are inefficient.
3. The treatment of this disease with x-rays, placed upon a practical basis by Sabouraud and Noiré, has proved to be highly efficient. In Paris it has shortened the course of the disease from two years to three months.
4. The objection to the use of x-rays in ringworm, on account of the possibility of producing permanent baldness, owing to inability to measure the rays properly, seems to be answered by the introduction of the Coolidge tube, with which the amount of rays absorbed can be measured with great accuracy.

5. Radiologists as well as dermatologists, in the United States, have been slow to grasp the importance of the x-ray treatment of this disease, but it is to be hoped that, before long, all cases will be treated by this method, which, while it probably will never eradicate the dis-

ease, should make it much less frequent in the future than in the past.

**The Treatment of Chilblains.**—Prevention is the most important feature in the treatment of this condition says a writer in the *Critic and Guide*, (Oct., 1916). The extremities should be warmly clothed but the wearing of tightly fitting garments should be prevented. The use of local massage to keep up the tone of the vessels is often of much service. Especial pains must be taken to keep the feet and hands as dry as possible. If the extremities perspire they should be frequently washed with warm water but great care should be taken to leave the skin dry. In this connection an antiseptic dusting powder, such as powdered siliceous earth 50 per cent., zinc oxide 25 per cent., boric acid 25 per cent., will be found useful. To the above may be added one to two per cent. of camphor or menthol.

In the first stage of chilblain, when the vessels are contracted slight stimulation may be used or the parts warmed. Formerly irritant applications such as iodine or the volatile oils were recommended.

In the second stage, that of venous engorgement, the indication is to preserve an equable temperature and await the return of vascular tone. The same local treatment should be carried out as recommended in the first stage, the powder serving to overcome the disagreeable itching that is so often present.

If ulceration occurs general aseptic principles must be carefully followed and a salve employed such as the following:

Resorcin .....	2.0 (30 grs.)
Menthol .....	3.0 (45 grs.)
Soft white petrolatum to..	100.0 (3½ ozs.)

**Intestinal Stasis.**—Dr. Eliza M. Mosher in her interesting article on Intestinal Stasis (*N. Y. Med. Jour.*, Oct. 28, 1916), advises the following treatment:—Intestinal stasis patients need to eat and sleep by the clock as nearly as possible; use meat sparingly and drink water plentifully between meals. Little, if any medicine is needed. Sometimes a digestive, a mild laxative, or a general tonic has to be given for a time. Russian oil or one of its substitutes should be taken without stint, for, since it is neither a medicine nor a food, it can be used without restriction. When bands or kinks are found, and fortunately these are present in not more than ten per cent. of enteroptopic patients, the case becomes one for surgical consideration. Here the x-ray does its great work, giving more minute and accurate information regarding the conditions to be dealt with than can otherwise be gained.

Unhappily, as a profession we are still in the twilight stage of operative treatment for the relief of chronic intestinal stasis. Lane, Bainbridge, Bloodgood, and others are lighting the path but their work, though brilliant, only makes clear the difficulties to be encountered,

and a need for the skill that comes only through familiarity with the complex conditions so commonly found, and a knowledge of the best methods for dealing surgically with each.

The following exercises are recommended to aid digestion, prevent constipation, and strengthen the abdominal wall.

I. Lie on the back (bladder empty and knees bent). Gently stroke the abdomen downward six times along the inside of the left hip, from ribs to pelvis.

II. Stroke three times across the abdomen on the navel line from the top of the right hip to the top of the left, then downward as in Exercise I.

III. Draw the lower abdomen forcibly inward by muscle contraction (not by breath), and imitate the movement involuntarily made in taking a long restful yawn—breathe in slowly all the air possible, stretching the trunk and neck forward, then as slowly breathe out all the air taken in. Repeat six or eight times. This exercise can also be taken in the sitting or standing posture and should be repeated often when enteroptosis is present.

IV. Forcibly draw in the lower abdominal wall (not by breath but by muscle contraction), then raise it and hold long enough to count ten. Do this three times. Rest and repeat.

If the abdomen is distended by gas, insert a small tube (the rectal point of a syringe) into the rectum before beginning the exercises; if retained, it will let out the gas as fast as it is carried down. Never apply pressure below and to the inside of the right hip (region of the appendix).

These exercises should be taken by every one on retiring, to overcome the sagging of abdominal organs due to the standing and sitting posture. They may be repeated half an hour or more before meals, if indigestion and gas are present.

**Cure for Scurvy.**—A writer in the November issue of the *Med. Standard* says that fruit juices, orange or prune, are the time-honored remedy for infantile scurvy, but the white potato has proved just as efficacious and within the reach of the poorest family. The proportion generally used is one tablespoonful of mashed potato to one pint of water, and added to the twenty-four hours' feeding of milk in place of the usual cereal diluent. The potato should be pared very thin and an average sized potato when mashed covers the amount needed. The mashed potato can be added to the water in which it is boiled and thus all of the vitamins conserved.

**The Causation of Rickets and its Treatment.**—Rickets is a disease of malnutrition but how comes the malnutrition? Funk believes that with scurvy, beriberi and pellagra it may be classed as a deficiency disease, that is, it is due to an absence or lack of "vitamines," the principles contained in milk or other fresh foods which are essential for good nutrition.

Eric Pritchard in his interesting article in the Sept., 1916, issue of *Pediatrics*, describes his views with respect to the causation of rickets. He is of the opinion that the condition is brought about by an excess of food which is disposed of in such a manner as will inflict the least possible injury on the organism as a whole. One of these methods depends on the short-circuiting of the oxidation processes, in fact, on the production of incompletely burnt-up products of combustion. This floods the blood with acid bodies of large molecular size, and is fully described in the paper referred to above. The injuries inflicted on the organism by this method of disposal are those which are included in the term "acidosis" which is in his opinion the most potent cause of rickets.

Pritchard is careful to point out that by excess of food, he does not mean the term to be interpreted in its popular acceptation. He means by the term relative excess, that is to say, a redundancy over and above that which is required for physiological purposes.

It will be thus observed that Pritchard's theory with regard to the causation of rickets is not in agreement with that of Funk, and others who believe that the condition is caused by a deficiency in food and not to excess.

**Scurvy and Pasteurized Milk.**—In his valuable and interesting paper before the American Pediatric Society, and reported in part in the *American Journal of Obstetrics and Diseases of Children* (July, 1916), Hess expresses the conviction that a diet of pasteurized milk leads to the production of scurvy in infants unless some antiscorbutic food is also given. The scurvy met by the author in infants fed on pasteurized milk was, as a rule, not of the florid type met with in infants fed for months on a proprietary food, but might be described as latent or rudimentary. There was a gradually increasing pallor, a failure to gain in weight, the development of some petechial hemorrhages, and in more marked instances, the subperitoneal hemorrhages. It would seem probable that this insidious type of the disorder was far more common than was generally recognized by physicians and that there were many infants suffering from slight nutritional disturbances which might be ascribed to this cause. When the pasteurized milk was replaced by raw milk the scorbutic condition improved, although it might be added that raw cow's milk was by no means comparable to orange juice as an antiscorbutic. It is not to be inferred from these conclusions that the use of pasteurized milk is fraught with danger, but merely that it is an incomplete diet for babies and must be given with antiscorbutic food. There are also secondary factors contributing to the development of scurvy, such as the individual variation depending upon hereditary characteristics, that is upon the amount of antiscorbutic material which the infant brings with it when it comes into the world. Secondary food factors also seemed to play a part and it seems that there is an intimate relationship between

the development of scurvy and the amount of carbohydrate in the dietary. The sovereign cure for scurvy is orange juice, which is efficacious even when boiled for ten minutes; potato, one of the best antiscorbutics for adults, may be used in infant feeding where orange juice cannot be readily obtained. For this purpose milk can be diluted with potato water, one tablespoonful of mashed potato to 1 pint of water, instead of the usual cereal decoction. In connection with this work observations were carried out to ascertain the effect of infantile scurvy on growth. This study embraced an interval of one year or more. Three periods might be distinguished in this investigation: a preliminary period of about three months, during which time the infants were weighed daily and measured every two weeks; a period embracing four months during which time the infants received a liberal diet of pasteurized milk and cereal, which differed from the previous period only in the fact that no orange juice was given; and an after period, lasting about six months, which dated from the time when orange juice or some other antiscorbutic was again added to the food. During the period when the antiscorbutic was discontinued particular attention was given to furnishing a sufficient quantity of food, and more cereal was given or the strength of the milk mixture was increased. It was found that although the infants continued to gain in most instances for a few weeks following the discontinuance of the orange juice, they soon reached a stationary plane and for months were unable to rise above this level, but increased in weight promptly when the antiscorbutic food was given added to their diet. It is very probable that infants cease to gain in weight at about eight months of age, during the third quarter of the first year of life for the want of this essential addition to their food, and fail to progress until mixed feeding is begun some months later. At present the rule may be said to be to add fruit juices to the infant's diet at about the sixth month, but it would seem that it should be given as soon as possible. There is no reason why a baby should not receive orange juice when a month old, and there are strong arguments in favor of such a procedure.

**Pellagra.**—In referring to the treatment of pellagra, Bond says that the gastrointestinal tract ought to be thoroughly disinfected and with this aim in view the following drugs have been found serviceable: *Internally*: calomel, beta-naphthol, acetone, salol. *Externally*: an ointment consisting of beta-naphthol, balsam of Peru, and zinc ointment; later, when the bullae have burst and a raw surface has been left, tar, salicylic acid, ammoniated mercury, and zinc ointment can be applied. *Diet*: A well balanced diet; ripe bananas daily; ripe papaws. *General*: Keeping in the shade as much as possible.

As a result of his special studies and experience Bond has reached the following conclusions: 1. That pellagra is a disease akin to Addison's disease. 2. That the causal bacteria

are in the intestines as indicated by the amount of indol and skatol present, and that it primarily affects the sympathetic nervous system and, secondarily, the central nervous system. 3. That there are factors in the actinic rays of the sun which can act as irritants to the exposed surface of the skin so as to intensify the condition. 4. That it responds to treatment by gastrointestinal antiseptics internally, and externally by the usual protective ointments.

**The Treatment of Tetanus.**—Sir David Bruce (*Lancet*, Oct. 23, 1916), discusses the treatment of tetanus, especially as seen in the war. He considers that the antitetanic serum has not proven markedly effective, yet he believes it is on the whole the best remedy we have; while in his opinion, there is no evidence that any benefit has accrued from carbolic acid or magnesium sulphate injections. He sums up the treatment of tetanus as follows:

1. Place the patient in a quiet, darkened room, under the care of a sympathetic and capable nurse.

2. The wound should receive the best possible surgical treatment, so as to insure the prompt and complete removal of all septic products.

3. The injection into the nerve-sheath of at least 3,000 units of antitetanic serum should be the treatment of choice. At the same time 10,000 to 20,000 units should be injected intravenously and subcutaneously. This procedure is to be repeated as many times as the course of the disease seems to demand.

4. Patients should receive also sedative drugs, notably chloral or chloretone, these to be given in full doses.

**More Olive Oil.**—If there is one piece of safe advice to cooks, it is, says a writer in *The Epicure*, to use olive oil more liberally.

Use olive oil in some recipes in place of butter. It is particularly delicious in gingerbread, and baked beans.

It is economical in frying because any olive oil left in the pan can be filtered through cheese-cloth and kept in a cool place for future use. It can be used over and over again.

Olive oil should be hot before the article to be fried is placed in the pan. Its temperature can be raised to over 600 degrees before it burns, whereas butter burns at a little over 200, suet at about 300 and lard at 325.

Olive oil, with the high degree of heat, quickly coats the outside of the article with a crust

which prevents the oil from penetrating. Butter, on account of the low temperature at which it must be kept so that it will not scorch, is really a poor frying medium.

When chickens or other birds are roasted, grilled or boiled, they should be basted with olive oil.

When preserving fruit, rub the kettle with olive oil, to prevent the fruit from burning.

**The Useful Lemon.**—A writer in the *Amer. Food Jour.* (Nov., 1916) says he very grateful when "handed a lemon," for it has many uses in the sickroom, the kitchen, 'round the house and in milady's chamber.

The juice from half a lemon in half of glass of water before breakfast will correct the most torpid liver and prevent bilious troubles.

For hoarseness, lemon and sugar will prove helpful and pleasant to take and will cure sore throat when used as a gargle.

In fever the lemon is cooling and of great value for moistening the lips and cleansing the tongue.

Two or three slices of lemon in a cup of strong tea often will cure a nervous headache and refresh the mind and body.

A spoonful of lemon juice in a cup of black coffee frequently will cure bilious headache.

An outward application of lemon will allay irritation caused by insect bites.

If a teaspoonful of lemon juice is added to boiling rice or sago, the kernels will be whiter and have a more delicate flavor.

**Milk and Communicable Diseases.**—Williams (*Med. Record*, Oct. 28, 1916), in his interesting article on Milk and Communicable Diseases comes to the conclusion that the chief objection to the pasteurization of milk is that it is a change from the long-continued habit of the use of raw milk and that, although there may be slight increase in the cost of milk that has been pasteurized, yet the health insurance that is given in preventing a larger number of epidemics of milk-borne infectious diseases is far more important than the small sum paid for this protection.

It must be said, however, that there are still a number of medical men and health officers who contend that pasteurized milk is nothing more than cooked filth, but sanitarians and health officers should insist that pasturized milk must be pasteurized clean milk and that every precaution should be taken to insure the milk being pasteurized in clean containers. The method of pasteurization should be supervised, for if the milk is improperly pasteurized complaints will come, and they will be made against the whole process of pasteurization rather than at the slip in the method. But if pasteurization is carried on intelligently and under the direction of qualified health officers it will give the quality of milk that the people demand, and will result in a diminution in the amount of communicable diseases.

# American Medicine

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**The High Cost of Living.**—The prices are soaring. Commodities of all descriptions have rapidly advanced in price during a period of time, supposedly, overwhelmingly prosperous. It begins to appear as tho a large measure of prosperity is of fictitious value. Wage increases have by no means kept pace with the rise in the costs of food-stuffs essential to life.

During one year, the wholesale prices of foods have advanced tremendously. As illustrations, 22 staple articles of food costing \$5.84 in 1915 demanded an outlay of \$7.41 one year later, 1916. This represents an average increase of 28.6 per cent. Such a necessity as potatoes brought 35 cents in the wholesale market for 15 pounds in 1915 and 75 cents in 1916. Four pounds of apples formerly cost 10 cents, now 20 cents; 1 pound of codfish 10 cents, now 15 cents; oatmeal 3 pounds for 12 cents has been changed to 15 cents; macaroni at 6 cents a pound has become 8 cents a pound; rice formerly at 5 cents a pound, now brings 6 cents; peas, a staple of general diet, only cost 18 cents for 2 pounds in 1915 and 30 cents in 1916. Onions advanced from 16 cents for 4 pounds to 20 cents; prunes from 14 cents for 2 pounds to 18 cents. Even bread at the wholesale rate of 80 cents for 12 pounds advanced to 96 cents. These increased prices of foods indicate a serious condition in this country.

From the standpoint of the health of the

community, it is of immense importance that it be possible for people in moderate circumstances to purchase the necessities of life in sufficient quantity to maintain strength and vigor. With the failure of wages to advance proportionately despite prosperity, there is a sharp disadvantage to the average consumer. He is deprived of the fullest benefits of his more regular labor. It may be said that there being less unemployment, that the average annual return for the industrial worker is higher than during preceding years, and in consequence, there is actually no great suffering imposed upon him. It is probable however, that even with the actual increase of employment, the reserve funds of families are just as exhausted now as during previous years when wages were lower and the costs of commodities were correspondingly decreased.

**A period of prosperity** is of service to the community only when the standard of living in the community may be raised and the possibility of saving for the rainy day is facilitated. Employers, in general, are now beginning to recognize the difficulties in maintaining an adequate living and there appears to be a marked movement toward the increase of wages paid to their employers in established industries.

The high prices now prevalent are seriously interfering with the extension of philanthropic work for which funds must be col-

lected. The foodstuffs have increased 25 per cent in price. Either the relief work of such organizations must be decreased or the funds collected must show a very marked increase.

In no time in the history of this country has there been such demands upon the sympathy and pocketbooks of the American people as at the present time. The large profits are being made by the few and the bulk of the population are no more able to make contributions than during the years that have passed.

The costs of administration in medical relief work are as high as ever, and with the necessity of expending larger sums for necessary food supplies, their accomplishments are hampered. Inasmuch as monthly budgets are established several months in advance of the beginning of a fiscal year and fixed amounts are set aside for specific expenditures during the ensuing year, it will be difficult for organizations to meet their obligations to the sick and needy in the community as effectively as is desirable unless further funds are forthcoming. There necessarily must be considerable drain above the estimated costs of running hospitals, almshouses, workhouses, and institutions of various types in order to maintain a dietary conducive to the physical and mental welfare of the numerous inmates.

There is naturally a limit to the expenditures possible by individuals or communities. When price and pocketbook clash, the total amount of the character of the food purchasable declines. Where rational dietaries have previously been instituted and staples have increased from 30 to 100 per cent, it becomes difficult to make dietetic readjustments to provide adequate nourishment within per capita costs formerly regarded as reasonable.

The upkeep of hospitals will be materially increased and, with fixed or limited incomes, the amount of service to be performed must necessarily fall unless a lower plane of service is temporarily accepted.

**Food is an essential of life.**—It is requisite for restoration to health. It is a fundamental requirement in maintaining health.

It is unfortunate, from the standpoint of education in dietetic value, that the increases in foodstuffs occur most particularly among those staple articles most desirable and healthful. With bread, butter, eggs, and cheese, beans, rice, sugar, and potatoes in the monetary ascendency, the strictures placed upon the average home are severe. Only optimism can see an early harmonious readjustment made between the purchasing power of the public and the cost demanded for the essentials of healthful living.

Assaults upon the food supply are fraught with great dangers to the welfare of the community. In this particular instance the law of supply and demand is not internal in this country. Indirectly, the people of this nation are suffering from the effects of the European struggle. Food dictatorships have been established in foreign lands in order to secure a reasonable distribution of foodstuffs and commissions have been formed to prevent the raising of prices. It appears to be doubtful whether the present extremely high prices are warrantable on account of decreased production. Exportation to other countries probably is a far more important factor in placing this additional financial burden upon the exploited American public.

The fees of physicians have not increased, and it is fair to assume that pinching and scraping is necessary in the homes of countless physicians in order to meet the increased demand upon their thin wallets.

**A knowledge of foodstuffs** best suited to the development of children and to the welfare of industrial workers loses much of its value when means are not at hand to secure them. The high cost of living today is a serious phase of the public health problem. Its effects will undoubtedly be manifest in various ways. It is important therefore that health departments and medical societies point out in no uncertain terms, the relations between larger food costs and communal health.

Here is a real problem of medical economics. Hunger is a primal instinct. Failure to possess the means to gratify it is attended with serious results. Decreased strength and vigor, malnutrition, increased susceptibility to disease, retarded convalescence, dulled mentality, and moral instability are but a few of the dire consequences, frequently attendant upon a prolonged period of insufficient nourishment. It is not even jocose to suggest that opposed to the high cost of living one may find the low cost of dying.

*Journal of Heredity* pointing out the fact that the birth rate of college women is far below that of the general average of American-born women. Johnson and Stutzman (*Journal of Heredity*, Volume VI, page 250) showed that for Wellesley College, during the period of 1879 to 1888, only about half the graduates were married and that the mothers had only 1.56 children each, while the rate of childbearing per capita graduate was only .86.

Until recently, there have been no really adequate studies of the marriage rates and birth rates in families of the graduates of men's colleges. In the *Harvard Graduate Magazine*, September, 1916, Dr. J. C. Phillips presents the results of his study of the graduates of Yale and Harvard for a period of 40 years. Merely considering his general averages, he reveals the fact that 74 per cent of the Harvard and 78 per cent of the Yale graduates married and that for the average class of 149.5 graduates 245.9 children were born for Harvard and in the case of Yale per class of 115.5, 225.1 children were born. The average number of children per capita per married graduate was 2.51 for Harvard and 2.57 for Yale, while the average number of children per capita per graduate was 1.71 for Harvard and 1.99 for Yale. During the four decades from 1850 to 1890, the number of childless marriages has been gradually increasing.

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**Eugenics and Higher Education.—** Eugenicists are mainly concerned with the quality of human stock that is to be developed. Their interest in the numerical increase of the population is in a sense subordinate to the more important factor of quality. It is obvious, however, that if procreation is limited among the intellectual classes and proceeds at a rapid rate among the less highly developed, the defective and the criminal classes, there is a significant alteration in the balance of procreating stock which cannot be disregarded by those studying racial improvement and deterioration.

Numerous studies have appeared in the

It is evident that the graduates of these schools who have married have just about given to the world children sufficient to reproduce their parents, assuming that all the children grow to maturity and in turn become parents. Twenty-two to 25 per cent of Harvard and Yale graduates never marry and 19 to 23 per cent of the marriages are infertile. To perpetuate the stock of graduates, it would be necessary, for every mar-

ried graduate having children to average more than 3 surviving children.

Inasmuch as the birth rate of families headed by male college graduates appears to be higher than that in families with college bred mothers, it would appear that college men for the most part do not mate with the graduates of women's institutions. Further analysis is undoubtedly required in order to prove the marriage rate and birth rate of intermarried college graduates.

Our colleges may not be all that can be desired. The student body may contain many undesirable types, but in general, it may be said that the graduates of the colleges of the land represent a high type of manhood and womanhood. The decrease in their fertility, from whatever causes that may be urged, presents a distinct dysgenic force in the community. Eugenics must take cognizance of the decline in the birth rate among educated parents.

**The birth rate of native born men** and women is today at low ebb and the growth in population of the country depends upon the birth rate of immigrants or of families with foreign born parents, whose opportunities for education have been practically negligible.

If one part of the human family is reproducing at a far lower rate than another part of it, the eugenicist must be interested in weighing the evidence as to the types of children which are preponderating in the birth rate. The birth of a few children from college graduate parentage may result in the production of children of finer quality, but this is in the realm of speculation. As an assumption, it is not unwarranted and deserves consideration alongside of the high birth rate recognized to exist among the

ignorant, the incompetent, and the defectives.

It is as important to increase the birth rate among high quality parents as to reduce or limit the procreation of unfavorable racial types.

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**Pre-Medical Education.**—The relation of higher education to medical practice is sufficiently complex to warrant continued discussion. Under the present standards of matriculation in medical schools, it is generally advised that the pre-medical student take a year of physics, two years of inorganic chemistry, a course in organic chemistry, together with a large amount of biology. Dr. C. K. Drinker in *Science* (November 10, 1916) calls into question the worth of this type of pre-medical study. His criticisms are suggestive of needed educational reforms.

A large proportion of the time now devoted to biology, histology, embryology, and text-book courses in human anatomy and physiology is pleasingly occupied by the student but is not necessarily the most serviceable use of valuable time for medical training. The alteration in medical curricula is marked by the decline in the time allotment available for general anatomic studies and the redistribution of hours to the various technical laboratory courses now essential to the intelligent understanding of modern medicine.

Pre-medical education has not been altered appreciably to meet the evolution of medicine itself. The study of the present day requires a thoro grounding in physics, chemistry, and mathematics, for the practical purposes of medical education. It is undoubtedly true that there have been nu-

merous successes in medicine where no collegiate training served as a foundation. It is equally true that a number of especially capable physicians, with marked talents and ambition, have risen above the obstacles of inadequate training and achieved success in the practice of medicine; and a few have actually accomplished noteworthy results in scientific research.

As a general principle, the medical student of today is better qualified by virtue of having acquired a complete course of collegiate training. His mental development is not merely along the lines of observation, but there has been evolved the power of reasoning, of logical thinking, of scientific judgment. For the average student of today, truly observational studies have a limited scope of usefulness, in so far as actual medical teaching is concerned. This does not mean that biological sciences do not possess immense worth in pre-medical education, but suggests rather that the study of physics, chemistry, and mathematics are of equal importance in preparing the student mind for coping with the problems of medical education.

The constant injection of definite scientific methods into practical medicine points out the importance of training medical students in all the sciences. Specialization in biology is to be deprecated just as much as would be the limitation of the student's study to physics or chemistry.

**Prospective medical students** should be trained in the fundamental sciences, in the abstract, as well as the concrete, sciences. Mathematics, logic, chemistry, physics, biological sciences, all have their contributions to make to the mental equipment of students. Considerable of the educational effort in medical colleges is wasted, owing to the lack of mental equipment and discipline of the

student body. The higher the grade of intelligence attacking the problems of medicine, the more intensive and definite is the information that can be imparted. There is much loss of time and energy in overcoming mental inertia which has developed as a result of faulty pre-medical training.

Dr. Drinker places his finger upon a real weakness when he calls attention to the fact that medical school catalogues advise the prospective student to fulfill the given requirements, but fail to urge him to extend his courses in every possible field with a view to acquiring the best equipment for the study of medicine.

The constant evolution of modern medicine indicates that its foundations rest not merely upon physics, chemistry, and biology, but that sociology and economics afford valuable principles for the development of the medical mind.

It is time that a new valuation was made of the mental power essential for effective medical practice and for medical research and investigation. The highly specialized training is undesirable in pre-medical education, as it narrows the horizon of the student and stresses in the youthful mind factors in medical education which in truth are no longer as important as some of the newer types of studies as preparation for mastering medical education.

**Medical colleges**, in establishing requirements for matriculation, have it in their power to suggest to collegiate institutions the relative advantages of various types of studies. Breadth of mind, the power of concentration, the ability to think clearly, to observe accurately, and to reason logically must be developed. The informational side of collegiate effort is serviceable only in so far as it can be made to function. The

direct utility of subjects studied is not always apparent, but it cannot be denied that the more diverse the mental training of the pre-medical student in general science, the more capable will he be to appreciate strictly technical medical facts and theories.

The success of medical schools is not entirely determined by the buildings, the laboratories, the equipment, and the capable professors. The student body which is to receive and absorb medical education is after all the most important problem in securing a well educated and highly trained group

- of graduates in medicine for the future. Considerations, therefore, of pre-medical education should be of paramount importance to the administrators of medical institutions. The pre-medical training should serve as the firmly laid foundation of regular medical instruction.
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**The Prognosis of Tuberculosis.**—The length of time required to accomplish an actual cure of tuberculosis is such that it puts it beyond the realm of possibility for most tuberculous persons. It is unfortunate, but none the less true, that outside of the individuals with incipient tuberculosis, the large majority of tuberculous victims cannot or will not continue under observation and treatment until their lesions are permanently arrested.

H. M. King (*Bulletin of the Johns Hopkins Hospital*, November 19, 1916) has contributed interesting and practical information with reference to the prognosis of tuberculosis. He calls attention to the fact that it is necessary to hold out to the patient "some definite objective, towards which the patient may look with some reasonable chance of achievement, as a goal to attain-

ment of which will free him from the more irksome restrictions that surround him while under systematic treatment." Noel Bardwell pointed out the importance of transforming a tuberculin infection from an "open" to a "closed" lesion. King has accepted this thesis as the most valuable single aim towards which all efforts should be directed. This presents a definite aim which should appeal to the intelligence of the average patient who, thereupon, becomes more patient and more willing to make sacrifices and to persevere in this treatment.

King's study involves an inquiry as to "what may reasonably be expected from intelligent care and treatment in various classes of tuberculous invalids, with the assumption, to start with, that a patient who will spend at least a month (in most instances many months) in a sanatorium will avail himself of every means of recovery within his reach, and with his sanatorium training will avoid, at least, the more dangerous pitfalls which beset the consumptive."

The basis of his inquiry consisted in the selection of 1,515 patients, all of whom living at the time of their discharge from the sanatorium, and of whom it could be learned whether they were living or dead at the expiration of five years or the period at which death occurred among those thus unfortunate. It was also known whether or not the sputum contained demonstrable tubercle bacilli during their stay at the sanatorium.

For the general population, the odds in favor of the probability of life at the end of five years was 19.4 to 1. For tuberculous patients, apparently cured at discharge, the odds were 11.3 to 1 in favor; for those with arrested lesions, 1.9 to 1 in favor; improved, 1.6 to 1 against; unimproved, 19.0 to 1 against life at the expiration of five years.

For tuberculous patients with the bacilli demonstrable during residence at the sanatorium the chances were 6.9 to 1 in favor; for those with sputum changing from bacillary to non-bacillary, 3.4 to 1 in favor; for those with sputum containing the bacilli on discharge, 2.5 to 1 against five more years of life.

The importance of early treatment of tuberculosis is evident in the fact that for tuberculous patients, regarded as having incipient tuberculosis on admission, the odds were 6.1 to 1 in favor; moderately advanced, 1.3 to 1 in favor; and far advanced 3.5 to 1 against the probability of living at the end of five years.

These results are significant in the consideration of the prognosis of various types of tuberculous individuals. It is true that they are figures for groups estimated from comparatively small numbers of patients. On the other hand, the figures may be safely accepted as indicating the general line of prognosis for tuberculous individuals who will spend at least one month in a sanatorium securing proper treatment and, what is more important, receiving thorough training in the special hygiene of living necessary for the prolongation of life in the tuberculous subject.

worthy, the forms of education to be advised, and the vocations best fitted for sufferers from heart diseases. In their program, one finds definite lines of work which appeal to the reason.

From the standpoint of industrial effectiveness, the nature of the occupation of sufferers from cardiac disease is of great moment. To learn during the school age those children affected with organic cardiac conditions and to guide them intelligently into the most suitable vocations is a work that promises much. A large amount of co-operation will be required, much study of individual fitness will be necessary, but the trial must be made in order to determine whether it is feasible to develop vocational guidance for "cardiac" children with self-support as the end result.

**The problem for adults** is fraught with greater difficulties because there is involved the adaptation of the patient to his environment and the alteration of long established habits of living in the patient himself. Changes of occupation, teaching new occupations, the provision for new trade training, the underwriting of self supporting businesses where larger amounts of rest may be possible are by no means simple measures to carry out on a large scale. It is recognized, however, that hygienic surroundings, ample rest when needed, freedom from worry and distress, and industrial adjustments are essentials to prolong the lives of cardiac sufferers.

The most glaring difficulty at the present time is the haste with which cardiac patients forsake actual medical care. Rest to them is not acknowledged as of worth equal to drugging. They are willing to take medicines for a long period of time if they may be about and in active employment. Decom-

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**"Cardiacs."**—The importance of heart diseases has not received the full recognition warranted by its frequency or effects. There is hope that the newly organized New York Association for the Prevention and Relief of Heart Diseases will be able to accumulate a large amount of evidence with reference to the causality, method of prevention, facilities for cure, the types of convalescent institutions most

pensation can only be prevented by prolonged and carefully supervised convalescence. Freed from the restraints of hospital or home, their energies are frequently quickly overtaxed and renewed rest is required. There is a dire lack of opportunity at the present time for the necessarily frequent periods of rest requisite to prevent decompensation.

If adequate care is not offered to the ordinary sufferer from organic heart diseases, he, sooner or later, falls into the class of the permanently disabled, whose economic value to the community is reduced from an asset to a liability.

The very chronicity of their condition makes them unacceptable to general hospitals, whose beds are too few for the reception of patients suffering from acute diseases. The seriousness of their disabilities makes them difficult to handle in convalescent homes, where a resident physician and nursing service are not available. At the same time, constant decompensation is not to be properly treated while they remain ambulatory patients. Their homes do not provide the essentials of quiet and hygiene, so important in conserving their vitality, and herein they become a serious charge upon the health and vigor of the family. There is sufficient familial distress when the income is already greatly depleted by virtue of the inability of the patient to work in gainful occupation or to assist in the management of the home.

If it were possible to establish some system of permanent institutional care, partaking of the nature of a hospital, a convalescent home, a farm, and a shop, it might be practical to place it upon a partially self-supporting basis and to continue the economic usefulness of the patients for a longer

period of time to the greater advantage of the community.

**The medical results thus far attained** in the treatment of cardiac diseases are decidedly inadequate. The social and economic benefits to be achieved thru more intelligent care are patent. Before instituting any thorough plan requiring the investment of large sums of private or public money, it is imperative that a complete survey be made of the numerous phases of cardiac diseases in their relation to personal, familial, and communal life and welfare.

The histories of patients discharged from hospitals might well be brought up to date, thru social service departments, in order to determine what has been the effect of hospital treatment and to know definitely how far it has been successful. As the function of a hospital is to restore patients to normal condition, in so far as may be possible, it cannot be doubted that medical institutions have a heavy responsibility when discharging patients. How far have hospitals been successful in living up to this responsibility? An investigation of cardiac patients will provide an excellent means of determining this fact.

#### **Complement Fixation in Tuberculosis.**

—Numerous investigations have been made with complement fixation tests in tuberculosis. The results have been largely unsatisfactory because of technical difficulties, tho it has long been evident that, with the proper antigen, there might arise a valuable method for the diagnosis and prognosis of tuberculosis. Various tests like Calmette's and von Pirquet's have demonstrated their restricted usefulness, while tuberculin reactions have

been assessed at a lower value than was originally given to them.

For practical purposes and social results, a test for the presence of tuberculosis should be able to differentiate active cases and arrested cases. It is obvious that the reaction must be positive in an overwhelmingly large proportion of the active cases and similarly negative in normal individuals or those suffering from any other disease beside tuberculosis.

Miller and Zinsser recently described a simple antigen prepared by grinding tubercle bacilli with dried table salt, to which sufficient distilled water was added to establish an isotonic solution. H. R. Miller (*J. A. M. A.*, November 18, 1916) reports his clinical experiences with this antigen, which he believes to be specific for determining active tuberculosis.

His results are striking. The reaction is practically always found positive in active tuberculosis, while non-tuberculous and normal patients react negatively. The serums of syphilitics, clinically free from tuberculosis, are also negative. Of particular value, prognostically and therapeutically, is the observation that the complement fixation reaction is as a rule negative in arrested cases.

From the point of view of the prevention of tuberculosis there is food for thought in the conclusion that tubercle bacilli carriers exist whose serums possess no antibodies, but whose sputum contains tubercle bacilli.

While conservatism demands that Miller's conclusions be not wholly accepted until his results have been corroborated by others making use of the same technic, the figures presented are fraught with interest and with encouragement that the early detection of disease during its obscure period is soon to be possible.

Inasmuch as the reaction loses its intensity of fixation as the progress of the disease is stopped, its prognostic value is of unusual importance. It is to be hoped that this complement fixation reaction will prove to be successful.

Such a step in advance in the diagnosis, prognosis, and treatment of tuberculosis is most devoutly to be wished. Its social importance transcends its medical usefulness. If it be recognized as a reliable specific reaction, it will promote the early diagnosis of even the so-called incipient cases of tuberculosis and enable treatment to be instituted before other clinical evidence makes the diagnosis reasonably definite. It will serve as a valuable control in the period of treatment in hospitals and sanatoriums and guide physicians and patients in the direction and care of afflicted individuals.

The real hope of therapeutic control of tuberculosis lies in early diagnosis. The promise of social control is not to be fulfilled by this single addition to our diagnostic powers, but greater optimism will be developed because of it.

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**Announcement.**—For a long time the costs of publishing AMERICAN MEDICINE have been progressively increasing. How to meet these costs, fairly and squarely, without imposing hardships on any one has been constantly before us for at least the past three years. Various plans and suggestions have been brought forward, but all have been lacking in some essential respect.

The enormous increase in the price of our paper is the last straw. Action is imperative and, therefore, we have raised the subscription price of AMERICAN MEDICINE from one dollar to two dollars. This applies to new subscribers only and anyone whose name appears on our list January 1st, 1917, will be allowed to renew two years at the old one dollar rate.

**Encouraging Research.**—The importance of prophylactic measures as part of municipal health work, is now recognized by the foremost health officers. The economic benefits of the prevention of disease has dawned upon the civil authorities, engaged in municipal administration. It is easier to secure funds to-day for the purpose of investigating the causes of disease with a view to obtaining data applicable to constructive programs of prevention.

In the *Journal of Medical Research*, November, 1916, appears a footnote which is highly illuminating as to the extent to which this fundamental idea of modern medicine has impressed itself upon some men, charged with the responsibility of administering public affairs.

From the Pathological Laboratory of the Boston City Hospital comes an interesting discussion of the Etiology of Scarlet Fever by Mallory and Medlar. Concerning their conclusions that scarlet fever may be due to a strongly Gram-positive bacillus, usually less virulent than the diphtheria bacillus, we have no comments at the present time. Further study and corroboration of their findings is necessary before their observations can be accepted as final.

The interesting item connected with their investigation is the fact that the work was undertaken at the suggestion of Mayor Curley of Boston "who believed that the hospital expenses of the city might eventually be lessened and many lives be saved, if the cause of scarlet fever could be discovered and treatment of the disease be put on a sound basis, similar to that of pathology."

Such an attitude is highly commendable and a growth of this type of interest in research work promises greater support to municipal laboratories and, possibly, the subsidizing by the cities of private or public hospital laboratories for the purpose of con-

ducting investigations into the etiology of diseases still obscure in origin. Public funds are constantly made available for investigations into conditions fraught with less significance and leading to results of far inferior value to the community.

The action of Mayor Curley merits warm commendation. His point of view is most creditable, and his motives highly estimable. It is to be hoped that his example in stimulating scientific investigation will achieve that sincere form of flattery known as imitation.

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**Dispensary Rounders.**—Medical men deprecate superstition. They frown upon ignorance. They discourage guess work. At the same time, they are wont to pass unsubstantiated opinions and make approximations which become in a sense current opinions in the profession on a large variety of subjects.

Those particularly interested in dispensaries believe that a considerable proportion of dispensary patients has become so habituated to dispensary methods as to actually enjoy dispensary life. They regard dispensary patients with a certain measure of distrust and suspect a large number of them of being dispensary rounders travelling around from one dispensary to another for the purpose of receiving pleasurable treatment.

If this were true, the waste of time and effort on the part of physicians would be manifest. All things considered, the general run of dispensary patients merely seek to relieve their ailments. The small sum that they pay for service is frequently large in proportion to their actual daily income, especially when the time lost from work is estimated as part of the cost for receiving the treatment.

Davis and Howland (*Modern Hospital*, October, 1916) report a study of the duplication of patients among some of the dispensaries of Boston. Their studies resulted in determining that only 12 patients out of the thousand went to more than one institution during a short period of time so that it might have been possible to secure simultaneous treatment. In their search for facts, they have been guided by a desire to reduce any unnecessary duplication of work among dispensaries, and their results indicate that the work of the admitting departments of the dispensaries has been excellently performed.

Dispensaries should have general rules forbidding the acceptance of patients who are under treatment at any other dispensary. There are naturally exceptions to this rule. A patient attending a tuberculosis clinic which does not have facilities for general work might receive simultaneous treatment at an aural dispensary or an institution for the relief of dental diseases. It is probable that the amount of overlapping of dispensary work is partially due to the shortcomings of the dispensaries themselves which do not provide adequate opportunities for general diagnostic and therapeutic purposes.

**The dispensary patient** is probably no more egotistic than is the ordinary sufferer from diseases consulting the private physician. Despite the rules of ethics, patients frequently are under treatment by more than one physician at one time. The corroboration of diagnosis is secured by recourse to a second physician without his knowledge or that of the original medical attendant. It is not uncommon for the general practitioner to advise patients to seek special attention at the hands of many types of specialists while he is looking after the general health of the patient.

In the interests of fairness and justice, it is proper that the facts of dispensary attendance should be investigated. General criticisms should not be indulged in before supporting data are available. The dispensary system is far from perfect, but critical discussion of its shortcomings fails in force when unsupported by actual knowledge.

The association of out-patient clinics presents an opportunity for the establishment of a clearing house system, such as has

been organized by philanthropic societies in large cities. Waste of time, effort, money, materials, and medical skill should be eliminated wherever possible. The "rounder" is to be discouraged. The reasons for his existence should be made clear.

Is the dispensary system suffering to any extent from this type of patient because of its own weaknesses in organization and its own lax practices? If such be the case, the relief from this problem probably lies in internal reforms rather than in the harsh and possibly injudicious treatment of the victim.

How serious is the dispensary rounder problem? Particular cases cannot serve as an index of the extent of the practice. The "doctor habit" is not to be encouraged among dispensary visitors, but if it exists in no larger proportion than holds true for patients in private practice, we may regard the dispensary rounder as an imaginary evil rather than a real one.

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**Medical Brotherliness.**—Solidarity in medical organizations has long been recognized as desirable. Various efforts have been made to promote the common understanding of medical problems and to establish medical societies upon a firm foundation of general confidence in their energy and interest in the welfare of the medical profession.

Few medical societies exist in which there are not differences of opinion as to medical policy, while petty politics have always played an active part.

Within the profession itself there are many moot problems making appeal to different types of practitioners which result in honest differences of opinion. It is fortunate that there is not unanimity of opinion because such a condition would conduce to stagnation, the limitations of progress, and the slow deterioration of organized effort. Opposition and obstacles yield the greatest impulse to energetic leadership.

It is a well recognized principle in general movements of reform that a campaign of abuse and vilification is not unlikely to be attended with success. One cannot reform a criminal by constantly pointing out his sins of commission or dwelling upon the fact that he is a thief, a second story man

or a rapist. Similarly, it is impossible to gain the support and cooperation of opponents in medical reforms by classifying them as ignorant, snobbish, spineless, or despicable. If opposition is due to a failure to understand the meaning of the advance contemplated, educational measures and supported arguments may be of avail.

Hostility is engendered by abuse, and support is not to be obtained where a lack of respect is evident.

It is unfortunate to find the *Medical Economist* (November, 1916) whose principles and purpose are devoted to the protection of the medical profession from exploitation, and whose efforts have been so fruitful of good in many instances, lapsing from the ordinary standards of expression in dealing with their colleagues. They are not justified in holding all persons differing with their views to be ignorant or snobbish or objects or contempt, or potential strike-breakers. Sympathy with their cause is not to be secured by calling men contemptible or ignorant.

A united medical organization may be possible as far as the majority is concerned, but no movement has ever been dependent upon the complete enrollment of all possible supporting members.

With a just cause, a serious minded purpose, a sound economic principle, progress will be made in the due course of time. There is such a thing as making haste slowly. It is far better to develop a firm and valuable nucleus for efficient work and promote a cause by natural accretions than to seek increased membership thru intimidation, threats, or accusations of various types.

Good faith must be assumed to exist on the part of defenders of both sides of prospective medical legislation. Those within the organization would resent the imputation of their motives by those not desiring to join the society. Manifestly, it is neither discreet nor wise to attack those whose good opinion one desires to secure and whose cooperation is deemed essential for the success of any contemplated movement for medical legislation.

We take this occasion to call attention to what appears to be an unfortunate and, we believe, an unintentional policy, because we believe that from the psychological, medical, and political point of view, a diatribe of this

character is fraught with danger to the success of the movement. As physicians, we resent misinterpretation, we object to abuse, and we do not countenance characterizations and classifications unwarranted by facts and unsupported by testimony or data. We cannot believe that members of the Federation of Medical Economic Leagues would be willing to submit to the same type of offensive treatment without active and proper denial of the right of any one to characterize them as purely selfish, despicable, ignorant, snobbish, or dishonest.

In order to retain the confidence of the public in the profession and to continue its esteem for medical men, as honorable practitioners of medicine, the profession itself must evidence respect for its own members and evidence a belief in the common honesty and integrity and public spiritedness of the members of the medical brotherhood.

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**Infant Mortality.**—"It was formerly believed that the rate of mortality among children who had not reached the first anniversary of their birth was a wise dispensation of nature, intended to prevent children with weak constitutions becoming too plentiful. To-day we know that a great infant mortality is a national disaster—on the one hand because numerous economic values are created without purpose and prematurely destroyed, and on the other because the causes of the high rate of infant mortality affect the powers of resistance of other infants and weaken the strength of the nation in its next generation."—Prof. Dietrich.

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**Who Are the Sane?**—If the definition of insanity was followed to the letter, were experts appointed to examine all men, few would escape the brand of insanity, but who could qualify as an expert since we may become insane upon the subject of insanity? All have their predilections and prejudices, symptoms of a mild form of mental bias, passing under the ambiguous name of eccentricities; and some there are, so erratic that we should call them insane did they not possess sufficient sanity to dissemble their weakness.—C. E. Warren, *Medical Fortnightly*.

**Successful Treatment of Hodgkin's Disease.**—A single case of Hodgkin's disease has been successfully treated by a series of injections of an autogenous vaccine made from cultures obtained from an excised gland. Hatcher and Lemmon (*Jour. A. M. A.*, November 13, 1915, p. 1359) give a full report of this case with two very interesting photographs. More than usual interest attaches to this experience since Hodgkin's disease has always been considered incurable, and, heretofore, all attempts to control it have been merely palliative. Some time ago Billings and Rosenow described a microorganism which was found in several cases of Hodgkin's disease. Hatcher's case was studied with this information in mind and in the meantime an extensive series of x-ray exposures was given without results. Then a small gland was excised from the neck and an autogenous vaccine was made, injections of which were given twice a week for seven weeks. The initial dose was 25 million organisms which was gradually increased to 2 billion.

Already vaccine therapy has many remarkable achievements to its credit, and while Hodgkin's disease is fortunately quite rare, when it is encountered this new method certainly deserves a further trial.

**Poliomyelitis.**—“Within a month or two, when the cool weather arrives, the present epidemic will subside. We live in busy days—but let us not forget. We need not go in search of problems—the children's plague is ever at our doors. And in the house of shattered hopes, where a baby's crib stands empty, or where a deformed child with a twisted back or an atrophied leg breaks the parental heart afresh every day—there will be no forgetting.”—*The Medical Review of Reviews*, Oct., 1916.

**Caution in Treating Teeth.**—It is known that a tooth may show no clinical signs of disease and yet the x-ray disclose apical abscess. When contemplating the divitalizing of a tooth one should have in mind that a dead tooth is a candidate for infection. Unless septic teeth can be cured promptly they must be extracted.



**The Menace of Weak Feet in Pregnancy.**—Grossman, (*Med. Record*, Dec. 16, 1916) calls attention to the condition of the feet in pregnancy, and says: “Altho much has been written about the hygiene of pregnancy and the puerperium, in which proper clothing and belts have been described and recommended, very little stress, if any, has been laid upon proper foot wear. Many authorities in referring to the subject, simply recommend a low heel shoe. Others overlook the topic entirely. It is true that the weak feet occurring during these periods do not differ materially from weak feet in general, still the presence of pregnancy seems to distract attention from the feet, and one is very apt to believe that the various symptoms complained of are the result of pregnancy rather than those of existing weak feet.”

That weak feet may be present for a long time without producing symptoms has been demonstrated time and again. It requires in such cases but a little added strain or perhaps a lowering of the general resistance of the patient, such as one would expect to occur during pregnancy, to produce symptoms. The symptoms rarely depend upon the amount of deformity present. A very slight eversion of the heels and heel cords may produce severe suffering and on the other hand a severe pes planus may produce very mild suffering. The relief of symptoms which occurs in the vast majority of the former type of cases, by the institution of proper treatment of the existing weak feet, proves beyond a doubt that the weak feet are responsible for these symptoms.”

The author continues the discussion of this important problem, considering in practical detail the causes, symptoms and treatment of foot weakness in pregnancy, and finally reaching the following conclusions:

1. All cases of pregnancy should be instructed as to the proper care of the feet.
2. Prophylactic measures should be in-

stituted, regardless of the presence or absence of weak feet.

3. Where neuralgic pains in the limbs, back, sciatic region, edema about the ankles are complained of, the presence of weak feet should be eliminated.

4. Only by the institution of prophylactic and early active treatment can we hope to prevent untold suffering in one of the most trying periods in the woman's life.

**County Health Administration.** — "In the whole range of conservatism," says W. S. Rankin, (*Journal of the A. M. A.*, Dec. 16, 1916) "there is probably no subject of greater importance at this time than that of county health administration. County health administration is important, first, on account of the size of the field, and second, on account of the stage of the development of the problem.

In size the field embraces approximately three thousand counties or rural governments in the United States. For 53 per cent. of the population of this country the county government is the nearest, the most direct, and the most responsive government; for this majority of our people the county or rural government is the nearest approach to the ultimate object of all government, to wit, intelligent self-control.

The present state of development of the county health government is embryonic, plastic, susceptible to direction. If organized influences, like that of this Association, if centralized agencies, like that of the federal government, the international health commission, and the state governments are to play a part in the development of an efficient county health government, now of all time is the time for action. Today county health administration is a twig; tomorrow it will be a well-formed or ill-formed limb."

#### **The Uncertainty of Therapeutic Measures in the Treatment of Urethritis.—**

"The unreliability of prevailing methods of therapeusis, and the unsatisfactory state of existing knowledge, concerning any type of pathology, may be recognized," states Mapes in his interesting and comprehensive article in the *American Journal of Surgery*

(Dec., 1916) continuing he says, "by the multiplicity of methods and remedial agents recommended for its alleviation or cure, and Neisserian urethrorrhea is not entitled to unqualified exception to the rule. Nearly all the drugs mentioned in the pharmacopeia, the scores of others unrecognized as legitimate by scientific therapeutists, have at some time been recommended or employed in the treatment of this disorder, alone or in combination—'internally, externally and eternally'—and their mere enumeration would require more space than this entire address.

When the immortal Neisser isolated the microorganism which unfortunately was erroneously named the gonococcus ('semen berry'), and which was later demonstrated as the essential etiologic factor of the disorder under consideration, it was confidently anticipated that the treatment, which had hitherto necessarily been purely empirical, would be promptly placed upon a strictly scientific and definitely understandable basis. That such expectation remains unrealized, and that there is yet no consensus of opinion nor unanimity of therapeutic procedure, constitute the principal *raison d'être* for commentaries of this character.

One of the simplest axioms in rational therapeusis is 'when the cause of the disease is known and can be definitely located, its elimination should be accomplished by the most available means.' And, paradoxical as it may appear, whereas in local invasion of the diplococcus of Neisser the essential etiological factor is definitely known; whereas its local presence is easy of determination by the employment of modern methods of investigation; whereas the resulting pathology is regarded by the majority of observers as distinctly remediable, the fact remains that no single method of therapeusis yet devised seems capable of certainly effecting an absolute cure, regardless of the period in the history of the disorder when such remediable measure may be applied."

#### **Preventive Medicine and Hygiene.—**

"The general practitioners who, under present conditions, fill the role of family physicians, come the nearest to occupying the position of salaried medical or hygienic ad-

visers; still, many of them," says Boardman Reed in the *American Journal of Clinical Medicine* (Dec., 1916) "fall far short of achieving what they might, if they studied hygiene thoroughly. The one subject in which a very large number of them is deficient is dietetics, and, in consequence, the heads of families in straitened circumstances are everywhere struggling to supply their households with foods that they would be healthier without, or at least with far less of them. If the doctors would advise people to make large use of eggs, milk, and cheese for the proteid part of their food—which need never be more than one-fourth of the whole and should be considerably less for idle and for sedentary persons and especially for those suffering from the diseases mentioned—it would be better. If, in addition to such economic substitutions, whole-wheat or graham bread were to take the place of the white bread eaten exclusively in most families, very little of the expensive flesh foods would be necessary. Moreover, if all the foods were thoroly chewed instead of bolted or washed down with coffee, tea or chocolate—all costly and usually highly sweetened compounds, which are not indispensable foodstuffs—life would be prolonged and consequently health be better. It seems unnecessary to repeat these hygienic axioms to physicians or to insist upon that other axiom that every healthy person should be required to drink a large quantity of pure water every day, and most of it at other times than at meals.

Lack of water and lack of fruit and vegetables at most of the meals, and lack of sufficient exercise are the principal causes of the almost universally prevalent constitution in this country. If the family physicians could be induced to do their full duty in instructing their patients in these respects, fewer patent medicines and less doctoring would be in vogue. In the end, perhaps, there would be less fees for the doctors, but they would have the satisfaction of seeing far fewer uncured dyspeptic patients."

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**The Future of the Medical Profession.—**  
"If we agree that changes in the profession mentioned above have occurred and are continuing to alter the practice of medicine, and if the changes occur in sociologic medi-

cine as forecast in the activities of the various organizations, which are advocating new laws to regulate the practice of medicine and surgery, what then, O Brethren, in the practice of medicine," asks F. L. Van Sickle in the *Medical Review of Reviews* (Dec.) "shall we do? Shall we stand idly by and have others regulate our business affairs and show us the various paths in which we are to travel, or may we not take the initiative ourselves? But I hear many of you say that the practice of medicine is an individual calling and the work of one cannot be done by another. I will agree, but the work of the present day practitioner is essentially the work of many men, which in former times was of necessity inflicted upon one individual who entered the domain of that science or art. It would seem to us that every city or town large enough to maintain a sufficient number of practitioners should soon see the coming events as portrayed in the 'handwriting upon the wall,' grasp the opportunity to associate themselves in groups, whether following the plan in the larger way as carried out in the Mayo Clinic, Rochester, Minn., the Massachusetts General Hospital in Boston, the Murphy Clinic in Chicago, the Lakeside Hospital in Cleveland and the Johns Hopkins in Baltimore. Or it may be that every hospital in the land may be made a basis of group arrangement, cooperative in their endeavor, the financial end of which must be re-arranged for the betterment of men in the profession. From these larger plans may we not develop the smaller or social center groups of physicians, wherein the same idea may be carried out, according to the nature of the practice in each locality? In some surgery may predominate, in others medical and special lines of practice may acquire the group control, in others industrial insurance may be commended, owing to the nature of industries in each locality.

Hence our final appeal to the members of the profession of this country is to re-organize themselves upon a protective co-operative basis. The advance should not be made from the side of the public, but should be our own. We should consider that while the scientific side of the practice of medicine must ever be uppermost in our minds and that efficiency should be our watchword, let us bury deep in oblivion our

former prejudice and strife, instil into our minds the most important principle upon which mankind has always existed, namely, self-preservation. By this cooperative endeavor we shall carry weight, not only in our concerted efforts, but it may be the means of commanding more attention from legislative authorities whenever changes are to be made in the laws, and in any manner whatsoever that shall affect those of us who are now upon duty's field, as well as those also who may follow in our footsteps in the years to come."

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**The Blood Pressure Fad.**—"Much as we supposed we knew about the significance of blood pressure, I, for one," says Dearborn (*Medical Record*, Sept. 16, 1916) "am convinced that it is only now that we are beginning to be really sure that the expression, 'her blood was up,' means something—but then not too much!"

"The origin of the present fad in regard to blood pressure appears to be, in part, the old-fashioned notion, almost a proverb, that one is as 'old as one's arteries'; in part, the common fear or phobia of apoplexy, which is now very commonly known by the laity to be due to the 'bursting' of an artery in the brain; partly from the attention given Metchnikoff's decadent theory as to a means of keeping the arteries elastic; and, finally, in part from the very wide medical advertising of blood pressure gages. The universality of this fad is really worth noting; the topic always excites almost 'popular' interest among laymen, and in some cases it has been unduly catered to. An illustration of this was in one of Dr. Evans' excellent and famous talks on health (published as syndicate matter in some of the newspapers of importance), in which he advised an old gentleman who was worrying about himself to secure an instrument and measure his own blood pressure; theoretically, of course, this advice is all wrong. We should never advise any one who is worried about himself to make any such quantitative study of his 'condition.'"

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**Private vs. State Medicine.**—"Convincing proof of the inadequacy of privately-

feed medicine along all lines is found" asserts Philbrick (*Western Medical Review*, Sept., 1916) "in the conditions for effective service demanded by specialists in various fields. In general, all emphasize the need of early diagnosis and continuity of treatment—these being impossible of attainment under the present system. Whether from financial inability or inertia, the average patient puts off as long as possible his visit to the physician. And after he has presented himself for examination, and treatment has been instituted, by well nigh every acquaintance he is advised to seek some other medical adviser. And if he be possessed of considerable means, at every turn he encounters, ready to snatch him, a hungry horde of medical vampires, made vampires by the system under which they work."

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**Conservatism in Therapeutics.**—"We have a record of certain Athenians and strangers in that city" says Dr. William F. Nulroy in the *New York Med. Journal*, Nov. 11, 1916, "who 'spent their time in nothing else but either to tell or to hear some new thing.' We have in our own time certain therapeutists who are like these ancient people, and I wish to record a gentle protest against this custom of theirs. It appears frequently. The mischief lies in discarding proved methods of successful treatment in dangerously severe cases, for the sake of others that are only experimental because they are new and supposedly more scientific. While the ultrascientist seeks a demonstration of truth, he must not forget that his patient is a human being with a life to be saved. In the younger generation of teachers of medicine and therefore, of necessity, in the younger practitioners, we see this spirit of egotism which assumes that the fathers in the profession were in the bonds of gross ignorance. Certainly we rejoice and are proud of recent attainments in therapeutics, but there can be no real progress without the conservation of the valuable things we already possess. I realize that in making these remarks I encounter the risk of being regarded as behind the times—emeritus perhaps—but I hold that a sane conservatism is perfectly consistent both with genuine progress and a sane freedom from accepted principles."



## THE ETIOLOGY OF RICKETS.

BY

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This, one of the most frequent of disorders amongst babies naturally attracted the attention of medical practitioners from the earliest times. Hippocrates and Galen probably refer to it but it only seems to have become common since the artificial feeding of infants has been widely diffused amongst all classes. Still even in the 17th century it was already being studied by enquiring minds, especially in England, where Glisson was the first to give it a definite identity. Since then much valuable work has been done by many men from the clinical, experimental and pathological standpoints to elucidate the exact conditions which give rise to it. Though from these investigations we have a fairly complete knowledge of the external causes of the disease we are still in ignorance of the exact way in which these causes bring about the various pathological changes. There is a natural tendency to find, if possible, a single etiological factor but so far the conclusion is forced on us that the causes are multiple and almost the only thing that can be said to be common to all cases is that the disease nearly invariably arises in young babies at the end of the period of lactation. The further causes are bad feed-

ing, bad hygiene and debilitating diseases one or more of which may be present in a particular case.

The pathological theories naturally divide themselves into two classes. In the first the lesions are regarded as being due to the absence of a necessary something from the sufferer's diet or surroundings, whilst in the second something noxious is supposed to be added to his circumstances.

The most obvious of the morbid changes are found in the bones. It is true that now-a-days we recognize that the disease is a general one and by no means confined to the bones and that the general affection, so far as the immediate welfare of the child is concerned, is probably more important than the bony changes. In earlier times, however this was not ascertained so that the investigations and hypotheses were mainly confined to the skeleton. In rickets the bones are lighter than normal and are distinctly deficient in the mineral constituents. Thus in healthy bone there should be a proportion of two-thirds mineral to one-third organic matter, but in rickety babies this proportion may be completely reversed. Of the minerals entering into the composition of bone the most important are the salts of calcium and of phosphoric acid and hence the bony alterations have been considered by different authors to be due to a deficiency in the intake of each of these substances and animal experiments have been adduced

in support of each contention. It is quite true that bony changes are found in young animals fed on a diet in which the calcium salts are absent or present in too small amount, but the changes are those of osteoporosis and not of rickets; these changes disappear when the proper proportion of calcium is restored to the intake, whereas rickets arises even when the diet contains plenty of calcium (there is more in cow's milk than in human milk) and the rickety child is not benefited by the addition of calcium salts to its food. Phosphorus still enjoys a great reputation on the continent of Europe as a drug for the treatment of rickets, but is seldom given in England where the results of treatment seem not at all inferior; it is usually given with some oil and it is possible that the benefit following its administration is due more to the vehicle than to the drug. Except for this there is no evidence that a lack of phosphorus has anything to do with the pathogenesis of rickets.

The chief essentials of food are proteids, fats and carbohydrates, one or more of which have been regarded as deficient in the diets of infants who subsequently become rickety. Taking them individually one usually finds that in faulty diets an attempt is made to make up for a lack of the more expensive proteids and fats by an excess of the cheaper carbohydrates so that there is seldom any deficiency of the latter in the diet of the rickety but much more often an excess. In passing one may note that this excess of carbohydrate does not seem of itself to cause the disease though it may act by disturbing digestion and hence interfering with the absorption and assimilation of other nutritive material. There is a good deal of evidence in favor of the view that rickets arises from the lack in the intake of

sufficient proteid and fat, especially the latter. It is in the artificially fed infants that rickets develops; in artificial methods of feeding carbohydrates tend to be put in the place of proteid and still more in the place of fat and the more carefully the diet is arranged to meet physiological requirements the less likely is the prevention of rickets. The disease is rare in breast fed infants and when it occurs may be put down to the poor quality of the mother's milk or to the baby being kept too long at the breast. Experimentally it has been shown that young lions fed on raw meat have become rickety, whilst the addition of fat, either as milk or cod liver oil, prevented the onset of the disease or cured it if it had already manifested itself. Fat, too, usually in the form of cod liver oil is the only medicament that is generally regarded as having a specific influence in the treatment of the complaint.

Digestive disturbances, though not invariable, are a common prelude to the onset of rickets. On any theory that ascribes the disease to nutritive deficiency their causative influence would be regarded as impeding the processes of absorption and assimilation. In this connection it should be noted that disorders of the alimentary canal, such as dyspepsia and diarrhea are of frequent occurrence during the course of rickets and that when they appear before the apparent onset of the disease they may really be early consequences rather than causes. The onset of rickets is very insidious and it is impossible to mark its exact moment of incidence. Nevertheless it seems clear that indigestion is a distinct factor in the production of some cases.

Diseases that impair the general health during the early months of life, such as congenital syphilis, are also usually followed by rickets when the infant enters its second

year. They also may be supposed to act by impairing the general nutrition. It is important to recognize, however, that severe illness, e. g., severe chronic diarrhea, is followed by marasmus and not by rickets and the same is true of starvation; apparently it is the improper quality of the food rather than the deficient quantity that acts as a causative agent.

Turning from the question of the diet one finds that there are other influences that are potent in the production of the disease. Rickets is relatively much more common amongst the babies, who are brought up in bad hygienic surroundings with lack of air and sunshine, than the difference of diet between them and their more fortunate brethren would account for. Its most frequent onset, too, is after the winter months with their necessary confinement and darkness. Amongst animals those that are confined in cages are the ones that become rickety and the disease is unknown when they are allowed to run wild. Findlay found that it was possible to induce rickets by confinement alone, the feeding of the caged individuals being the same as the free and yet the latter never showed any sign of the disease. Absence of sunshine, air and exercise may be conceived as affecting absorption and assimilation of food and thus affecting general nutrition so that these observations can be brought within the bounds of the hypotheses that regard some food deficiency as the essential cause of rickets. In spite of Findlay's experiments we can be sure that they are not in themselves sufficient since Eskimo infants who for six months are confined to cramped dwellings with no sunshine and no fresh air do not become rickety. These infants are breast fed for nearly two years and have always an excessive amount of fat.

In these days of ductless glands and hormones it was inevitable that deficiency of some internal secretion should be regarded by some theorists as a possible explanation of the phenomena of the disease. The thyroid, suprarenals and thymus have all been put under suspicion but there is no real evidence to implicate any one of them. It is true that some cases have apparently benefited slightly by thyroid medication but the symptoms of the complaint are not those of thyroid deficiency and the results of giving thyroid are not marked enough to warrant any belief that disturbance of the functions of the gland has anything to do with causing the disease.

From the foregoing considerations it may be concluded that though improper diet, lack of air, exercise and sunshine all seem to have their share in the production of the disease, no theory of deficiency founded on these facts gives a satisfactory explanation of its exact pathogenesis or the causation of its symptoms.

Theories of deficiency having been found wanting it remains to consider the hypotheses which regard the excessive production of some normal constituent of the body or the presence of some superadded poison as the probable cause. Of these the earliest was concerned with lactic acid which was supposed to be produced in excess and to dissolve away the mineral constituents of the bones. There is, however, no evidence of excessive production or excretion of lactic acid or the lactates; this hypothesis, too, is merely concerned with the demineralization of the bones and ignores the other striking phenomena that are also present.

A more recent hypothesis regards the morbid changes as due to a toxin derived from that home of the mythical and unidentified toxin, the alimentary canal. Dyspep-

sia and fermentative changes in the intestine are frequent preludes to rickets but they are by no means of invariable occurrence. The symptoms and morbid changes are of an extraordinary variety such as it is difficult to imagine produced by a single toxic body and none of the alimentary toxins of which we have any definite knowledge produce results at all similar. Thus while it is difficult to disprove the production and specific action of such a toxin probability is strongly against its existence.

A novel and interesting view has lately been propounded by Eric Pritchard (*Proceedings, Royal Society of Medicine, Children's Section, 1916, p. 91*). He regards rickets as being caused by a relative excess of food, that is to say an excess of nutritive material over and above the child's requirements. A weakly child or a child confined to an airless room without exercise requires physiologically much less food than a more normal babe. What is deficient for the healthy infant may be in relative excess for the other. He points out that the organism can dispose of such nutritive excess in various ways. For instance it may store it up for future use as glycogen or fat; it may burn it up completely and eliminate the waste products as carbon dioxide, water and urea, or the combustion may be incomplete resulting in the formation of acid bodies (e. g. lactic, uric, glycuronic acids, etc.) of high molecular weight, which must abstract bases from the bones and elsewhere to neutralize them. The method of disposal will depend on the circumstances of each individual case and often all methods will be used. Pritchard believes that the evidences of the attempt to grapple with excessive intake are to be found in rickets and constitute the main manifestations of the disease. The excessive storing of fat is

often present; how frequently the prize baby or the baby photographed to advertise some patent food is rickety tho "well nourished." Complete combustion of the superfluous material implies an excessive intake of oxygen; the oxygen consumption of early rickets still awaits determination. The excessive heat produced would, however, lead to sweating and dilatation of the vascular capillaries of the face and other exposed parts in the effort to dissipate it. Incomplete combustion, according to Pritchard, would lead to acidosis, which may be expected to bring about demineralization of bone, destruction of red corpuscles and consequent anemia, air hunger due to depletion of oxygen carriers and later various nervous phenomena. Owing to the hemolytic disturbances there would be compensatory activity of the blood forming organs especially the red marrow, leading to enlargement of the epiphyses to supply more marrow to cope with the demand. It can be seen at a glance how large a number of the manifestations of rickets can be explained by this ingenious hypothesis, but much more is wanted before it can be accepted as a complete solution of the pathogenesis of the disease. Some obvious difficulties strike one at once. It possibly affords an explanation of the general loss of tone of both striped and unstriped muscle which is such a conspicuous feature of the complaint, to which the inability to walk and the gaseous distension of the abdomen are largely due since certain acids diminish muscle tone. Still loss of muscle tone is not a feature of definite "acidosis" as we at present know it in human beings and "acidosis" means diminished alkalinity and not the presence of free acids in the blood or elsewhere. The beneficial effect of superaddition of fat to the diet receives no explanation from the

hypothesis. Pritchard treats his cases by fresh air exercise and by limiting the quantity of food, but even in the illustrative case which he published in his paper he gave excess of fat in the form of cod liver oil.

It may be concluded that at present there is no completely satisfactory theory as to the causation of rickets. Pritchard's hypothesis that the complaint is due to a relative excess of food affords a better explanation of the observed phenomena than any other yet advanced but it still requires a good deal of corroborative evidence before it can be generally accepted. The solution of this problem is of the greatest importance since on it depends the rational treatment and prevention of one of the greatest scourges of infancy.

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## PRINCIPLES INVOLVED IN NOTIFICATION OF TUBERCULOSIS.

BY

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Many of our problems have to do with physical facts capable of direct demonstration, while others deal with the ethical bearings of certain groups of facts upon man's relations to society. The notification of disease belongs peculiarly to the latter class and hence becomes very properly a subject for discussion. The war has been of importance to our generation since it has forced into prominence certain public issues which have demanded attention, but which in times of peace are merely academic discussions. England had voluntary enlistment and met with amazing success, but yet more men were demanded. She had regis-

tration and still men were required. Finally came compulsion in order to make sure that every man did his duty.

A cholera or smallpox epidemic in the past similarly demanded positive action on the part of all members of a community, based on the axiom,—*Salus populi, suprema lex*. Now in discussing our present subject, I can best predicate its importance by referring to the Canadian Association for the Prevention of Tuberculosis as the only association organized especially to deal with a single disease which kills its 10,000 annually in Canada and further involves 100,000 sick persons distributed thruout the Province of Canada, and the still larger number of families to which these cases belong. In loss of hours of labor, in the impoverishment of families, in the transmission of the taint, resulting in neuroses affecting the normal, physical and mental growth of children, and in the general reduction of individual, social and national effectiveness, no single disease in northern climates plays so important a part as tuberculosis. Moreover it is a disease closely associated with the social and economic evils of society. It is essentially a disease of ignorance, poverty, bad housing, overcrowding and slum surroundings.

The National Association and Local Leagues, Boards of Health, Provincial and Local, are accustomed to dealing especially with the problem of tuberculosis. Veterinary Associations, Charitable Associations, Welfare Leagues, Children's Milk Depots and other organizations give themselves especially to the investigation and prevention of this disease of society, while physicians since Koch's discovery of the *bacillus tuberculosis* have devoted in a thousand laboratories their scientific knowledge to the elucidation of the mysteries surrounding the disease. In

Canada there are roughly 7,000 practitioners all of whom are engaged directly in treating cases of tuberculosis with more or less success. Assuming that 50,000 cases are under treatment, it is apparent that each physician would have to do with about 7 cases yearly; while, if each represented a family of five, society is interested in at least 250,000 persons exposed to cases of the disease. It is about twenty years since (or in 1897) after an acrimonious discussion at the Academy of Medicine, New York, and much writing in medical journals that the City Board of Health took the positive step of making the notification of tuberculosis compulsory. Speaking of this in a paper in 1913 Dr. Biggs, now State Commissioner of Health, New York, said:

"Of the various features of the anti-tuberculosis work, none is more fundamentally important than notification and registration of cases; and none has been more misunderstood or opposed by the medical profession. In spite of almost innumerable objections at first urged, it has finally been realized that no adequate control of tuberculosis can be effected without such notification and the objectors one by one have been silenced. \* \* \* \* \* Certain it is that not one of the disastrous consequences urged against notification has materialized and in New York City such notification has now been in force for almost twenty years."

RATIO OF NOTIFICATIONS TO DEATHS FROM  
TUBERCULOSIS (PHthisis) FOR THE YEARS  
1910-1912.

	Death rate per 1,000	Total Notifications	Proportion of cases to 100
Birmingham .....	1.28	4,394	404
Liverpool .....	1.49	3,690	329
Manchester .....	1.53	2,398	216
Bradford .....	1.26	921	253
Portsmouth .....	1.13	1,267	475
Sheffield .....	1.22	980	173
Edinburgh .....	1.26	1,255	309
Glasgow .....	1.32	2,330	225
New York, 1911.....	2.35	51,211	290

NOTE.—New York in 1881 had 4.92 deaths per 1,000.

Clearly in Canada, if we want to deal effectively with 50,000 active cases of tuberculosis, we must have them notified and registered. This is necessary for very obvious reasons; but it is enough to say that with notification ever increasing the effectiveness of the measures taken the death rate in every city adopting it seriously has been steadily decreasing.

It would, however, be but an imperfect argument for notification, if we did not set forth clearly the detailed reasons for requiring it. I am fortunate in being able to give such reasons in the language of one of the most experienced superintendents of sanatoria in Canada, who has come probably more intimately into touch with both the sanatorium treatment and the municipal or board of health phase of the work than any other of our superintendents. These are briefly:

First: That most of the tuberculosis in adults develops from infections acquired in childhood.

Second: That for the future public authorities and social workers as well as heads of families must take much greater precautions to protect the children of their families.

Third: That inasmuch as the children are much more vulnerable than adults, the precautions adequate for protecting children will prove more than adequate for protecting adults from infection.

Fourth: That the program of schools should be so changed that more physical training should be practiced daily.

Fifth: That in all cities there should be more medical inspection of school children with the assistance of trained nurses to complete the work of home inspection.

Sixth: That under compulsion every adult case of open tuberculosis should go to the sanatorium if there are children in the same house.

Seventh: That if patients are allowed to remain at home, it must be under the direct supervision of the medical officer of the city

who will lay down the condition of such home treatment and who if satisfied that proper precautions are not being carried out would compel such persons to go to the sanatorium whether they wished to or not.

Eighth: That where summer camps are proposed it would be in practice as easy to arrange for patients remaining at the sanatorium for twenty-four hours as for half the day and that if such a scheme be undertaken it will be better to arrange for this to be done from the beginning.

Ninth: That the longer medical men have experience in dealing with sanatoria, the more they become convinced that the difficulties of curing tuberculosis are underrated rather than overrated and that if such summer camp cases were allowed to go home at night, they would be exposed to over-crowded rooms and to commit indiscretions which would counteract much of the good which was got during the day.

Tenth: That experience shows that the supervision of even early cases must be very strict and that so long as there is active trouble in the lungs, with temperature and sputum, the patients should be kept at absolute rest during the twenty-four hours; while it has been shown that half an hour of indiscretion as exercise, in the case of an ignorant patient will undo the good of the other twenty-three.

Eleventh: Experience shows that in the majority of cases in ignorant people, it is a fact that after they get rid of the feeling of extreme languor and exhaustion and are feeling well, this class of patient has to be compelled to get better by means of the strictest discipline and the experienced superintendent will insist that his control of the patients during this period while in the sanatorium be as complete as when the patient is in bed.

Twelfth: That scientific and general observation is increasingly showing the unsatisfactory results of the home treatment of tuberculosis.

Thirteenth: That careful observation of children in forest schools and lakeside summer camps showed that a number of the cases were suffering from active disease, were having some temperature and that their treatment as too commonly observed was not producing the favorable results

which complete rest during such conditions would ensure. That forest schools are satisfactory for children, who have been exposed or who may be pre-tuberculous, but show no signs of active disease. When the latter is shown, such children should be in a preventorium, where they would be under twenty-four hours a day supervision.

The results of the treatment of sanatorium cases, of the dispensary work and of the close touch kept with the City Board of Health in Hamilton over a period of ten years, are, as might be expected by one holding such views as quoted, logically supported by results. Thus in 1906 there were 71 patients in the Hamilton sanatorium, while in 1912-13 there were 109 inmates. In 1907 with a population of 50,000 the deaths were 87 while in 1912 with a population of 80,000 the deaths in Hamilton were 64. In the city of Ottawa with but little notification of cases there were 118 cases in 1912-13 in the sanatorium compared with 109 in Hamilton, but the cases examined in the dispensary were only 137 compared with 718 in Hamilton. The death rate in Hamilton fell during the period given from 1.74 per 1,000 to 0.89 or more than 50%, while in Ottawa with better hospital and sanatorium equipment the deaths for 1915 were 1.57 per thousand, or an increase over 1912 when there were 130 deaths. Perhaps it is fairest to say there has been no noticeable decrease in Ottawa. Many further illustrations, showing the effects and efficient subsequent action might be given; but enough has been said to make the necessity for thoro notification of tuberculosis apparent.

Who then is to do it? Not the patient because he too often is kept in the dark regarding his actual condition, which in most cases proves to be a mistaken kindness. Naturally the physician, when sure of the true nature of his case, will inform the parents if not the family, since they will

look anxiously to him for advice. As most families and persons will be guided by their physician, it is apparent that he must be the one, who ought and will be expected to act wholly in the interests of the patient and family. If he acts wisely he will at once urge sanatorium treatment, unless other favorable family conditions exist. To do this the physician must see the medical health officer and discuss the case fully with him in order that the best steps demanded in the case be taken. Thus notification is inevitable.

The point has been raised as to whether, if public health Acts demand compulsory notification, the physician should be paid for filling out the blank form of the public health department and transmitting it free to the medical health officer. Perhaps we can best discuss the matter by referring to the several classes which exist in a community.

1st. The cases more or less acute among the poorer classes which demand prompt action. These should go at once to the sanatorium and so notification becomes inevitable.

2nd. Cases of a less acute character, not as yet expectorating and therefore dangerous, but in which the physician will advise probably rest and change of air. As we have seen in the quoted opinion given, this action, however well intended, is in the light of known facts not to be encouraged, and the physician in ordinary practice takes much risk if he does not discuss the case in all its bearings with the superintendent of the sanatorium and the medical health officer.

3rd. Cases of the well-to-do who may prefer sending their sick to some private sanatorium perhaps at a distance from home. In even such a case there can obviously come no harm from the physician notifying the medical health officer who is required by statute to maintain the strictest supervision of the health of all in his municipality.

The position may perhaps be taken by some prominent physician that it is a private family and professional matter and that

the public health officer and community have no interest in the matter. In fact that it is none of their business. This attitude of course leads us into the discussion of the wide problem of the rights of the individual and the duties and functions of government. In this connection while it is not settling the matter, it is worth while to quote Dr. Biggs twenty years after he began the free examination of sputum in the laboratory of the New York Board of Health. He said in 1913:

"In spite of the almost innumerable objections at first urged, it has finally been "realized that no adequate control of tuberculosis can be effected without such "notification and the objectors one by one "have been silenced \* \* \* \* \* \* \* \* \* \* \* \* "Certain it is that not one of the disastrous "consequences urged against notification has "materialized and in New York City such "notification has now been in force for al- "most twenty years."

Now were all the cases of tuberculosis amongst the wealthy, who could send them to private sanatoria, then some force might seem to exist in such an argument; but such instances are but an insignificant fraction of the cases and hence demand no great discussion. Every good physician to-day is too much of a sociologist not to cooperate in any general practice, in the public interest; but it is to be feared that in too many cases it is the indifferent and sometimes incompetent physician who is primarily concerned in keeping on his list of patients, cases which give him no great trouble, and which in the light of past experience he will not get perhaps much discredit from in the family if he allows such to drag along under treatment, until as a *dernier ressort* he suggests that perhaps a sanatorium might do something for the patient. Clearly if this still represents much of the modern attitude and practice it is quite evident that

notification, registration, making the advantages of sanatorium treatment known in every possible way, are absolutely essential to dealing efficiently with the disease. But perhaps the question may be raised, why should not the physician who is to notify and take all these other steps in the interest of his patient and public be paid for his trouble? In reply there can be no good reason why he should not be paid and especially should the patient or those responsible for his care pay and pay adequately for the advice given and trouble taken.

Further I would add that, if the patient and family cannot pay, then the municipality or its board of health should pay for receiving the notification of the existence of any case, since the highest function of government is to protect and conserve the lives of its citizens and notification is a means to this end. The case is however, different should a physician claim the right to refuse to notify without being paid. As a matter of fact he cannot in ordinary cases act in the best interests of his patient and of the highest art and science of his profession, unless he makes provision for sanatorium treatment of the patient and for the examination of other members of the exposed family with a view to their early treatment if found diseased. It ought to be clearly recognized that if Medicine is a profession then its highest ideals must be maintained in the practice of it. If, however, it be an art or business sanctioned by law and licensed, as the movies on the one hand or the sale of liquor on the other, then in the interests of the public it must be strictly regulated and one of the first things the Legislature can say is: "That for the granting of the license to practice Medicine a physician must under the Registration Act, report at once every birth and death oc-

curing in his practice and likewise must report every case of communicable disease that comes under his charge." Indeed, it is an axiom in all law and government that the licensing power carries with it the right, not only to regulate what it licenses, but also to inspect the carrying on of the art or trade which it licenses as to its complying with the law. If, however, the medical profession can make it clear to the Legislature, licensing or regulating body, that for what it does for the public, in the matter of notifying tuberculosis it should be paid per case, say a dollar, then no objection could anywhere be raised; but I am firmly convinced that for the paltry few dollars a medical man would thus earn in a year, the profession would lose in the lobbying, which would be necessary to obtain it, very much more ethically. There is a whole group of human actions falling into categories, which cannot be measured by any monetary consideration or value. We have in English no term, which so neatly expresses this as does the French expression "*Noblesse oblige.*" The soldier sees in "*Noman's Land*" a wounded enemy who cannot be removed; a water bottle and some bread are thrown over to him because *Noblesse Oblige!* The physician answers the night bell and is summoned to attend a poor woman, where his pay is problematical: *Noblesse Oblige!* The social worker spends many weary hours for humanity in the slums for sweet charity's sake. *Noblesse Oblige!* And so with many other duties which are really privileges—laid upon because we are units in the social organism; and none of these seems so great as the fact that each of us is in a position to play some part in fighting tuberculosis. We are all aware of the remarkable work which the district nurse, or hospital nurse, has done in not only following

up and reporting upon cases of tuberculosis which are known, but also in discovering new cases in these families or elsewhere. To such an extent has this work grown that assisting the other agencies, it has reduced tuberculosis notably more in New York City than in New York State. This past year has seen enacted State legislation in New York giving county tuberculosis hospitals authority to employ:

"A county nurse or nurses for the discovery of tuberculosis cases and for the visitation of such cases and of patients discharged from the hospital and for such other duties as may seem appropriate, and may cause to be examined by the superintendent or one of his medical staff suspected cases of tuberculosis reported to it by the county nurse or nurses or by physicians, teachers, employers, heads of families, or others, and to take such other steps for the care, treatment and prevention of tuberculosis as it may from time to time deem wise."

The Secretary of the State Department of Health writing about such a nurse's work says: Naturally successful work along these lines presupposes on the part of the nurse, tact, diligence, patience and skill \* \* \* \* Therefore very often her success with any given patient or his family will depend more upon good management than anything else \* \* \* \* "Altho the nurse may teach sanitation to the family, under such circumstances she may find it necessary also to enlist the advice and assistance of some responsible charitable agency." If the householder, district nurse or physician can in any way thru discovering and notifying to the proper health authorities, cases of tuberculosis under similar circumstances, then no consideration will permit such doing violence to the delicate sentiment contained in "Noblesse Oblige!"

## THE POLIOMYELITIS EPIDEMIC—A REVIEW OF THE FIELD WORK PERFORMED BY THE HEALTH DEPARTMENT.<sup>1</sup>

BY

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In discussing the activities of the New York Health Department in the epidemic of infantile paralysis which we have experienced during the last few months, I shall have to speak from a Manhattan viewpoint, as it is in that borough alone that I have any personal knowledge of the fight. I wish to state also that I am speaking as a worker in the ranks and that my remarks have not the seal of any great authority. In the beginning of this paper permit me to remark that I am aware that in certain quarters considerable criticism has been leveled at some or all of the features of the campaign against this dreaded sickness; but, while I am not here as an apologist for the department in any sense, it would seem that these critics miss an important point, namely, that in fighting a disease whose etiology and mode of transmission is shrouded in such a veil of mystery as is acute anterior poliomyelitis, it is entirely justifiable to use any reasonable idea offered as a possible means of limiting its spread. So that while it may well be that some of the methods used will be shown in the light of our future knowledge to have been useless, it is worthy of note that in this borough where the battle began with the first case, the daily average of reports has been far below that of Brooklyn even in the height of the trouble.

It was about June 25th that the first cases

<sup>1</sup> Read at the October meeting of the N. Y. Polyclinic Clinical Society.

were reported in Manhattan, a little over two weeks after the disease was discovered in Brooklyn, the epidemic at that time being in full bloom in that borough. The division of infectious diseases was watching and promptly put its machinery into action. It was at the beginning of vacation time, but as soon as it was recognized that the cases being reported were overtaxing the powers of our regular force of diagnosticians, all vacation leaves were rescinded, the borough chiefs who were away were recalled, some special appointments were made from the civil service list and ten inspectors were temporarily transferred from the Bureau of Child Hygiene. Naturally the resources of the division were severely taxed for a few days by the influx of so many new men who were unfamiliar with the routine, but every one got to work very earnestly and with a creditable degree of cheerfulness, in an effort to do their best in a very trying situation.

The plan of control was simple, a set of rules was drawn up and if the family were able to meet the requirements satisfactorily the patient was permitted to remain at home under close supervision; if not, the case was removed forthwith, peaceably if possible, otherwise by force to the department hospitals or to one of the public or private institutions which so kindly offered to help out in the serious emergency which had been thrust upon the city. For sometime past the department has set an arbitrary period of six weeks as the limit of isolation in infantile paralysis and this period was extended to eight weeks during the epidemic. The rules and regulations mentioned a moment ago, were framed for this year, and are as follows:

1. A physician must be in constant attendance.

2. There must be a room which can be shut off from the rest of the house or apartment.

3. There must be a nurse or a member of the family delegated to act as a nurse, shut up in the sick room with the patient; and this nurse must not attend to any of the other household duties.

4. There must be a toilet in the apartment.

5. All windows must be properly screened.

6. Other children in the family under 16 years of age must remain strictly quarantined for 10 weeks, or two weeks after the patient is discharged.

As one can readily see from acquaintance with the New York apartment house, very few people could meet these requirements in toto; in fact the number of cases which were allowed to remain at home during the entire period of the epidemic was negligible; this you understand refers only to Manhattan. I may add in this connection, that in the event of any break of quarantine rules, which in each instance were plainly laid before the family at the first visit of the inspector, the patient was promptly removed to the hospital. At the beginning of the epidemic and to a less extent, throughout July and August, patients were brought back to town from the country in public or private vehicles. This naturally was difficult to prevent, but it was decided, warning having failed, if it was proven that the patient was returned to the city with the knowledge that it had poliomyelitis, the child would have to go to the hospital regardless of conditions at home.

A large percentage of the cases were reported to the department by phone; others by the official postal card. An effort was made to get each day's crop of cases into the hospital on the day they were reported. As a matter of fact, it was almost impossible to accomplish this, as a steady stream of reports was pouring in day and night for

the first six weeks of the epidemic. All cases, however, seen by diagnosticians up until seven or eight p. m., and sometimes later, were removed, the later cases being held over until early next morning. Each diagnostician received instructions to see his cases as promptly as possible and to report back instantly on each positive case. If the case was to be removed he left a card with complete information for the hospital noted upon it. If the request was made that the patient be allowed to remain at home, the diagnostician surveyed the apartment and decided as to whether it was feasible; or if the case was not properly isolated at the time of this visit, but it appeared to him that the rules of the department could be complied with, he gave the family a reasonable number of hours to prepare and revisited the home at the expiration of that time. In any event the door of the apartment and the entrance of the house were at once placarded.

When a case was removed to the hospital or died a prompt order was served upon the landlord for a complete renovation of the apartment, the placards remaining in place until the work was finished or, in case there were other children in the family, until two weeks had elapsed. No restrictions were placed on members of the family over 16, save in the case of the nurse or in the event that one or more of the adults were food handlers. The children however were kept under rather close supervision by nurses and health officers for two weeks after the death, removal or recovery of the patient. So while the quarantine regulations affecting the patient, other children and nurse were made as rigid as possible, an effort was made to relieve adults and wage earners of any unnecessary restrictions. The writer has been greatly impressed with the fact that in his personal experience with these

cases there was a marked spirit of cooperation with the department shown by the attending physicians in almost every case; also, that there was among the parents, a notable degree of self sacrifice shown in the matter of the removal of their children to the hospitals, and the percentage of forcible removals (that is where the police were called in to aid) has been very low.

During the early and panicky days of the epidemic, the department was of course flooded with reports of cases not alone by physicians, but by parents and other members of the family, by neighbors, interested citizens and anonymous complainants; and the investigations resulted in a wide range of findings. Many were real cases of poliomyelitis, but almost as many were diagnosed as mosquito bites, hives, rheumatism, teething and in some instances the supposed patient was found to be in perfectly normal condition. This however in a short time changed and it has not been usual in the weeks since July 15th to visit a reported case in which it was impossible to find some ground at least for the report. The diagnosticians have worked hard, faithfully and for the most part intelligently, and they have remained on duty 24 hours a day, Sundays and holidays included. When it is considered that some of these doctors had had very little experience in the diagnosis of this disease and that in this epidemic there have been a lot of unusual cases, many with slight muscular involvement and abortive cases with no paralysis the number of mistaken diagnoses has been remarkably small. I have talked with the visiting physicians in some of the larger hospitals and they agree that the record has been most creditable. The examination of the spinal fluid by the laboratory has been of wonderful assistance in clearing up obscure cases, and in a number of instances the patients with suspicious

symptoms were isolated at home temporarily, until a report from a lumbar puncture could be obtained.

Many physicians present tonight are qualified to speak far more authoritatively than the writer on the medical aspect of infantile paralysis. These gentlemen, I believe, will bear me out in the statement that from a diagnostic standpoint, this epidemic has been characterized by a large variety of types. A good proportion of the fairly large number of patients I have personally inspected have suffered from facial involvement, either alone or in conjunction with muscles or groups of muscles elsewhere in the body. In one case there was ptosis of both upper eyelids, with no apparent disturbance elsewhere. Two children who were cousins, each ran a violent course of temperature with nervous manifestations for nine days before any paralysis appeared and in each case the right side of the face and the pharyngeal muscles were involved. These children lived in different parts of town and the second child to be affected was indirectly exposed to the original case about five days after the first child became ill. The first of the cases just noted was interesting also from the fact that the nervous symptoms which accompanied the appearance of the pharyngeal paralysis were a good deal like those exhibited in rabies, and I am told that this feature has been recognized by other observers. It is worth mentioning that improvement in this case was very rapid, so rapid, in fact, that the visiting physician in the hospital said forty-eight hours later, that a mistake in diagnosis had been made, tho on further examination, he decided he was wrong. Another case of interest was proved to have the disease by lumbar puncture, altho no paralysis appeared after a pretty long stage of acute symptoms. How-

ever, five days after the temperature dropped to normal and the child seemed to be all right, a paralysis of the left leg and lumbar muscles developed with marked general weakness. Time does not allow even a superficial review of many interesting cases reported to us. A great number of patients have weathered the attack with no paralytic symptoms. Many of these have been listed as true cases by a positive lumbar, and they were treated by the department as any other case and subjected to the same quarantine restrictions. It would be very interesting to know how many of this class had their attack and recovered without any one suspecting the real cause; and this feature is certainly worth attention when considering the uncanny way in which this epidemic spread thru the city.

I do not wish to bore you with an array of figures, but in concluding this paper I would like to present a very few statistics gleaned from the department records. There have been, all told, in the city a little over 9,000 cases to date. The death rate in the entire city has been about 25%, in the borough of Richmond, where the disease appears to be stamped out, the rate was 19.3%.

There have been only about 135 cases in adults over 16 years of age.

In a study of 1,848 cases in which death resulted:

1,510 died in the first week of the disease.

211 died in the second week of the disease.

60 died in the third week of the disease.

67 died after the third week. The fourth day of the disease proves most fatal. There have been up to a few days ago 335 additional cases in the same family.

257 additional cases in the same house, but not in same family.

86 pairs of cases have had coincident onset, i. e., the same day.

65 pairs were 1 day apart.

33 pairs were 2 days apart.  
30 pairs were 3 days apart.  
31 pairs were 4 days apart.  
32 pairs were 5 days apart. After the 5th day the number of additional cases drops off rapidly.

## VICARIOUS VAGINISMUS.

BY

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Vaginismus is a neurosis manifested by a spasmotic contraction of the constrictor cunnii and some of the other muscles of the pelvic floor, thus preventing marital congress. This is the short comprehensive definition usually given of this peculiar anomaly. According to this definition vicarious vaginismus is a neurosis manifested by a spasmotic or clonic contraction of other muscles, not belonging to the group of the pelvic floor. In this way marital approach is prevented in an indirect way.

The primary underlying cause of genuine vaginismus is supposed to be some local anomaly. Even the authors who consider vaginismus a general neurosis assume an irritable condition of the psychomotor areas of the sex-organs. Although according to their theory the functional condition has no pathological basis at the sex-organs, still they believe that there is a certain irritation in the genital centers. The following case of painful convulsive contractions of a number of muscles, not belonging to the pelvic floor, at the least touch of the woman's legs by the husband's hand, shows that the cause of vaginismus is not always a sexual irritation at the periphery or at the center.

Mrs. S., thirty-five years of age, is fifteen years married and has a child, ten years of age. Her mother is somewhat mentally defective. She herself was always very

nervous but otherwise enjoyed perfect health.

The first four years of their married life, the couple thought that they could not afford an increase in the family and practiced coitus reservatus. When the time arrived when they thought that they could afford to have a child they began to live a normal sex-life, and a speedy pregnancy was the result. At the time of the confinement the couple lived in a small town in Maine, where the necessary hospital facilities, as found in the large centers of population, were missing. The confinement was very hard, and the patient suffered from convulsions after the birth of the child. The doctor, therefore, recommended the couple to avoid having any more children. For this reason the couple began again their old practice of coitus reservatus. In order to reach the stage of orgasm the patient demanded the massage of the clitoris with the glans penis. Only in this way was the relief of the nervous tension and of the material congestion possible.

A few years after the confinement the couple moved to a suburb of New York City, where they occupied a two story house. Their common bedroom was on the first floor. One of the rooms on the ground floor was occupied by a medical student who after his examination took up laboratory work as his specialty. He does not practice medicine.

In the last few years the patient had several mental shocks. Several deaths occurred in the family. The economic conditions gave her a good deal of anxiety. Her parents had to live with her and did not make life very agreeable to her. Finally the husband became ill with typhoid fever and suffered a relapse so that he was bound to his bed for seventy-five days. During the husband's sickness the patient fixed up for herself a bedroom on the ground floor, the same floor where the young physician lived. The latter was very kind to Mr. S. and nursed him during the entire sickness.

After Mr. S. recovered from his typhoid fever he had an attack of phlebitis which kept him again in bed for a considerable length of time. Since this illness was not infectious any longer Mr. S. wanted his wife to move back to the top floor, but the young laboratory man objected, claiming

that both husband and wife needed a rest. In this way husband and wife continued to occupy two different bedrooms on two different floors of the house at a time when Mr. S. could not see any necessity for this separation any longer.

One morning Mr. S. came down stairs a little earlier than usual. When he entered his wife's bedroom he found his wife in bed yet and the young doctor, attired in his dressing-gown only, standing in the middle of the room and talking to his wife. This impropriety of a young man being in a married woman's bedroom in such an attire greatly excited Mr. S. and he gave vent to his feelings. After the storm, wife and medical friend succeeded in convincing Mr. S. that there was nothing wrong in the young physician's presence in the woman's bedroom, and a general reconciliation followed. Still the sexual colored experience during the scene made such an impression upon the patient that she developed the following symptom.

When the couple are in their bed, at the least touch of the patient by her husband, not perchance of her vulva but even of her legs, a general paroxysm sets in. The patient's face expresses terror, respiration is accelerated, the heart palpitates and a general convulsive state is produced. The muscles of the limbs contract violently and a tremor of the entire body ensues. She screams loud and runs down stairs to her own bedroom. In spite of the affection she claims to have for her husband and her wish to satisfy him she is unable to bear being touched by him.

These paroxysms have been going on for almost two years, and during this time marital relations had to be interrupted. The husband had to give up approaching his wife. She tries hard to fight against her peculiarity and has succeeded to remain quiet when touched at any other part of the body, but at the least touch of the vulvar region the paroxysm immediately sets in and does not stop till she has reached her own bedroom down stairs.

Almost every night before retiring and every morning before rising she comes up to him in his bed, and tentative approaches are tried but always with the same results. She assures her husband that she will finally succeed to overcome her peculiarity, but

since the condition had lasted already almost two years, Mr. S. came to consult the writer, whose book on sex-anomalies he has read, whether anything could be done for her. The patient alleges to suffer great mental agony because she cannot live with him as his wife.

Mr. S. was told to send over his wife for examination and treatment, but as yet she did not make her appearance. She apparently refuses to submit to any treatment in spite of her alleged mental agonies.

This case of vicarious<sup>1</sup> vaginismus is of great interest on account of its etiology. The usual causes given for genuine vaginismus such as traumatisms through attempts at defloration, ulcerations, fissures or irritations, urethral caruncle, neuroma, inflammations, rigid unyielding hymen, etc., cannot be taken into consideration in this case. Excessive hyperesthesia of the hymen and vulvular outlet, or excessive irritability and tenderness of vulva, vagina, etc., are of no moment here either, since the spasmodic contractions take place even upon touching the legs. Excessive pain at the moment of congress, making the same impossible, cannot be the cause of the paroxysm in our case because intromission had not been tried for the last two years. Even the cause given by some authors, such as Scanzoni and Lorain, who claim that vaginismus is not caused by a narrowness of the organs or any other local anomalies but has rather a psychological reason, namely the fear of pain at the moment of intromission, may be rightly excluded in our case. All through her conjugal life up to the erotically toned experience between her husband and the young physician in her bedroom, marital approaches were entirely possible. Only since the unpleasantly affective incident

<sup>1</sup> In the same sense as the monthly epistaxis is called vicarious menstruation, the contractions of the other muscles instead of the constrictor cunnii may be called vicarious vaginismus.

have the hysterical attacks begun to take place.

The only reason for these attacks can therefore be hysteria pure and simple. The symptom is unconsciously used as a defence-reaction against conjugal incompatibility, just as every other hysterical symptom, according to the new psychology of the unconscious, is only a certain defence-reaction.

Our patient belongs to the degenerative type. She is afflicted with a morbid heredity. Her mother is suffering from a defective mentality. The entire sexual life of our patient was abnormal, onanistic. Non-satisfaction of the sexual impulse was her share of conjugal approaches. The practice of coitus reservatus left her each time excited without the benefit of the relief from the material congestion and nervous tension. The consequence of the insufficient satisfaction after sexual irritation was her demand for the masturbative contacts between clitoris and glans penis. Hence normal marital relations with her husband must have become quite disgusting to her long before the incident in her bedroom.<sup>1</sup>

In her subconscious self a certain antagonism developed against her husband. She rebelled against such unfruitful unsatisfactory approachments, long before her acquaintance with the young physician. The unpleasant bondage of submitting to intromission without the benefit of the final orgasm became almost unbearable to her.

<sup>1</sup> Even the great cynic Zola says, "Si l'enfant n'est pas au bout, l'amour n'est qu'une saleté initiale." In our case neither child nor the redeeming feature of sexual satisfaction could result from the interrupted congress. Although the polluting congress was practiced in her interest, with her conscious consent and even upon her demand, still the subconscious self felt a certain disgust against these practices.

The result of all these disagreeable emotions was a certain psycho-sexual trauma. Still she would have continued to lead her unnatural sex life, as many another woman does, but for her husband's sickness.

During this long illness, through the common nursing of the husband, a certain attachment developed between her and the young sacrificing doctor. Being of old puritanical New England stock, her relations to the man she unconsciously loved were perfectly proper. She still believes that she is thoroughly devoted to her husband. But in her subconsciousness her husband and his sexual practices are repulsive to her. The situation after the scene of jealousy in her bedroom between husband and lover became entirely unbearable, and she could not find any other way out of the dilemma but by developing her hysterical symptom.

The hysterical condition protects her from her husband's approachments. Her dislike for her husband or rather for his practices dwells in her subconsciousness. There she loves another man, and this complex forced her to find a defence against her marital relations. Some reaction was necessary, so she unconsciously developed the psycho-genetic paroxysm which was to become her defence against the reminiscence irradiating from the complex. The hysterical convulsions prevented and still prevent any intimate relations with her husband or with anyone else. The hysterical symptom is the excuse for refusing to resume her marital relations.

In her conscious state she may fight against the repugnance, still subconsciously she is well satisfied with her defence-reaction. This is the reason why she refuses to submit to treatment. Subconsciously she has no wish to be relieved from the

hysterical attacks. The hysterical paroxysm is her balm for her psycho-sexual trauma.

In the light of this case, it is not improbable that even genuine vaginismus is, in the majority of cases, a real hysteria, i. e., unconsciously volitional and only very rarely a neurosis, i. e., based upon a peripheral or central nervous irritation. The spasmodic contractions of the muscles of the pelvic floor are only a defence reaction against marital approaches.

Naturally in most of the cases of vaginismus the basis for the paroxysms is not incompatibility or lack of affection but fear of imaginary pain. In the great majority of cases, vaginismus is found in the newly married woman, or in the virgo intacta. As a young girl she has heard from her married friends or has probably read about the pain connected with defloration. If she is of a neurotic temperament the exaggeration of such alleged pain creates a psychic trauma and a certain repugnance against marital relations. The paroxysm is then the defence reaction against the first approach. It is not the narrow hymen which evokes the contraction of the constrictor cunni, but the fear of pain at the rupture of the hymen. In most cases of vaginismus the hymen is not narrow at all and is not the cause of the obstruction. In the last case of hymenectomy the writer performed on a physician's bride, the hymen under anesthesia, was perfectly dilatable, as to admit the introduction of three fingers. Hence it was not the narrow hymen that caused the contraction of the constrictor cunni, and its removal could not have been the cause of the cure. The constrictor cunni muscle was not touched by the operation, still the contractions of this muscle ceased upon the excision of the hymen. The reason is that with the excision of the hymen the cause of

the patient's anxiety was removed and a defence was not needed any longer. If vaginismus is a hysterical anxiety neurosis, not a neurosis based on either peripheral or central irritation, the suggestive action of the operation will remove the anxiety. The patient is cured not through the actual enlargement of the orifice of the vagina but by the removal of the corpus delicti which caused the anxiety.

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## THE PROFESSIONAL SECRET AND VENEREAL DISEASES.

BY  
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The standard text-books in medicine printed as late as 1913 taught that if a man had gone thru a modern treatment for syphilis, given by a competent physician and extended over three years, and during the fourth year, without treatment, he repeatedly showed a negative Wassermann reaction, he might marry. This was the common opinion of physicians, but it is erroneous. In one series of 562 cases of hereditary syphilis observed by Fournier 60 children, over 10 per cent., were infected more than six years after the primary parental inoculation. Bruhns reported the outcome of the Wassermann test repeated yearly from 1908 to 1915 in 100 private cases infected with syphilis ten or more years before the time of the report: in 42 the test was constantly negative; in 32 positive at first but negative later; in 7 constantly positive notwithstanding repeated courses of treatment; in 3 positive at first, then long negative, but finally changing to positive again; in 8 negative at first but finally posi-

tive; in 8 negative at first, then positive, and finally negative. Fifty-eight per cent. of these patients were uncured after ten years; more than that, because some who gave constant negative reactions developed brain syphilis or tabes. In others the long negative reaction for five or six years indicated cure, and physicians would pronounce such cases positively cured, but suddenly they changed to a positive reaction without any clinical manifestations showing at the time. Blaschko of Berlin at the Seventeenth International Medical Congress in 1913, in the presence of Erlich, Wassermann and Hata, said no one could even talk of a cure of syphilis until an interval of ten years without symptoms had elapsed. When a blood Wassermann is negative a spinal fluid reaction may be positive.

In from sixty to seventy-five per cent. of all cases of tabes or paresis members of the family other than the patient have shown infection. The proportion of infections in the families of tabetics and paretics is far larger than that found in families in which syphilis does not go on to these extremes. These and other facts strongly indicate that the form of syphilis which ends in tabes or paresis remains infectious over a much longer time than ordinary syphilis does. Raven reported in 1914 an investigation of ninety families in each of which a case of metalues had developed. The interval between the date of infection and the marriage was known in about half of these, and it was four years in two families, five years in one, and from six to twenty-one years in ten. Fournier in 4,400 cases of syphilis saw three cases where the tertiary symptoms appeared fifty years after infection, and one case fifty-five years after infection. Bonnet<sup>1</sup> reported such a case which came to him for

treatment fifty-four years after infection. Syphilis that affects the nervous system as in tabes and paresis when it appears as such is incurable, and there is no means whereby we can tell whether a given patient has an infection of this nature. Once a syphilitic, not necessarily always a syphilitic; but once a syphilitic possibly always a syphilitic, and that no matter what the treatment or the lack of clinical symptoms; damaged goods of this kind are to be looked upon as damaged goods forever. There is even question of late of spirochete carriers, as there are typhoid carriers and diphtheria carriers, who can infect others while not suffering themselves. If one who has been a syphilitic marries without informing the other party to the contract of the condition, the injustice is, without doubt, very grave. Eugenics as a prudent investigation of conditions before marriage is a good thing; eugenics as the drivel of scientific agitators, who can not tell the difference between a gentleman and a corn-fed hog, is quite another thing; but there can not be too much eugenic foresight when syphilis is concerned.

If a physician knows that a person who has been infected with syphilis is about to marry should the physician warn the innocent party? There are several conditions: 1, the person about to marry may be actively infectious; 2, the person may be probably infective, as anyone is who has had syphilis; 3, the physician may know the fact of the infection officially or unofficially; 4, the person who is infective may have gone to the physician for treatment for a condition not connected with syphilis, say, for bronchitis, or a broken bone, and the physician in the examination discovers syphilis. Again, there are various kinds of secrets: natural, promised, and entrusted secrets. A

<sup>1</sup> Lyon Méd., Nov. 7, 1907.

natural secret is one which obliges us in justice to observe it if divulging it will gravely injure anyone in possession or reputation. We are not obliged to observe a secret of this kind at the risk of our lives unless the damage from the divulging should affect the community gravely. 2. A promised secret obliges to silence either gravely or lightly according to the intention of the promiser. Where reasonable doubt exists as to grave obligation such obligation does not exist. A promise to secrecy made even under oath is not binding if one is obliged in justice to reveal the secret; we must testify to the crime of another when a judge legitimately demands our testimony even if we have promised not to tell anything. If, however, a secret is entrusted to one, and divulging it would cause grave damage, but neither justice nor similar circumstances oblige us to reveal it, we are bound to observe the secret even when questioned by a judge, because the judge's question in this condition is not legitimate, and he may not abrogate the natural right by which an entrusted secret is protected.

When a secret is entrusted expressly or tacitly to a physician or a lawyer, as such, it becomes a professional secret, and is called a strict or absolutely natural secret, and this kind of secret obliges more strictly than any other, not only in honor but morally. It is a grave crime to divulge such a secret except under certain qualifications. If the material of the secret is trivial the obligation may be trivial. A professional secret may be revealed if keeping it should cause public injury, or injury to an innocent person, or injury to the physician or lawyer to whom the secret has been entrusted. It is for the common good of humanity that entrusted secrets should be observed unless so grave a damage befalls another from the

observance that it becomes more conducive to public good to reveal than to conceal. To let an infective syphilitic, for example, spread his disease because an entrusted secret is kept is a much greater damage to the public than a good.

If a patient with syphilis goes to a physician for the treatment of some other physical disability, and the physician discovers the syphilis in the course of the examination this knowledge would be a tacitly entrusted professional secret. Whether, however, a secret that a man is actively infective or very probably infective with syphilis is entrusted to the physician tacitly or directly it is not a privileged secret, owing to the danger or certainty of extraordinary calamity to the innocent second party.

The fact that in cases of active or latent syphilis the disease has been acquired criminally does not in itself affect the state of the question one way or another. Criminal syphilitics have a right to reputation and goods despite the moral condition. Even where the disease has been incurred without moral guilt the syphilitic is always a formally or materially unjust aggressor in a prospective marriage to an innocent and uninfected second person, and is to be treated accordingly. If a woman may kill an unjust aggressor in defence of her chastity, and her natural protectors may do the same deed, the physician who is one of her natural protectors may divulge the secret of the man's condition in defence of her from a fate, which in many respects is worse than rape.

In keeping with this matter of entrusted secrets it is worth noting that physicians should remember the case-histories they leave after them at death, or which they leave unguarded in their offices, are likely to be read by some third party who has no

right to the secrets they contain. Case-histories which contain professional secrets should have the name and address in cipher. Access to case-histories in hospitals by members of the staff and others is easy, and here again the name of the patient and his address should be in cipher when the case is venereal.

Gonorrhea can affect any part of the body, and when the disease is chronic it may be a source of infection for years. If a man who has had gonorrhea wishes to marry after careful treatment, most physicians will permit him to do so if he passes the customary tests which indicate cure; nevertheless he is always dangerous. All the tests are to be tried repeatedly, and if negative for months the physician may say the man is *probably* cured, but no physician can guarantee the cure. Not one physician in 500 can make all the tests, and the effects of gonorrhoeic infection in a woman are so appalling that any woman who unwittingly marries a man that has had the disease is rash. Emil Noeggerath, whose book on latent gonorrhea changed the medical doctrine on the disease, said of women: "Once infected always infected." Norris<sup>1</sup> reports a case where the gonococcus was latent in a man for twenty years, and he then infected his wife, and wished to divorce her until he found that he himself was at fault. Sax<sup>2</sup> reported an infection after 14 years; MacMunn<sup>3</sup>, one after 15 years. These are exceptional durations in the male for virulence, but not for continuance of the diplococcus.

Neisser, the discoverer of the gonococcus, held that with the exception of measles gonorrhea is the most widespread malady. By sterilizing men and women and by abortion

it holds down the birthrate more than any other disease. Norris thinks that 12,000 prostitutes die annually from the effects of gonorrhea, and his estimate seems to be for America alone. The estimate, too, is that fifty per cent. of all pelvic inflammatory disease in women is gonorrhoeic; and Neisser, Bumm, and Fürbinger hold that from twenty to fifty per cent. of childless marriages are due to gonorrhea. Probably more than twenty per cent. of all the blindness in the world is from the same cause.

Before 1881, when Credé introduced prophylactic treatment for ophthalmia neonatorum, every maternity hospital had a department isolated for the care of infants suffering with this disease. At the present day, however, despite the precautions taken, this disease is quite common. Pennsylvania and New York alone spend \$242,000 annually for the support of asylums for the blind, and about forty per cent. of the children in these asylums were blinded by gonorrhoeal ophthalmia. The United States spends \$1,800,000 yearly on victims of ophthalmia neonatorum, and more than three billion dollars annually because of venereal diseases generally—this is Howard Kelly's estimate and it is very conservative. Authorities think a third of a million of married women in the United States are suffering from gonorrhea brought to them by their husbands. The invalidism and suffering they undergo is indescribable.

The moral guilt of a person that infects another with gonorrhea is graded by the extent of the physical injury done, and the physician who permits a gonorrhoeic to marry is an accomplice in crime, if his protest can prevent the marriage. He is commonly a nasty accomplice because he keeps silence thru cowardice or avarice. Gonorrhea, as every physician knows, can cause cystitis,

<sup>1</sup> *Gonorrhea in Women*, Philadelphia, 1913, p. 123.

<sup>2</sup> *Trans. American Urological Ass'n.*, Vol. III.

<sup>3</sup> *Lancet*, November 24, 1906.

with all the suffering, loss of work and danger of renal infection of this state; lymphadenitis; proctitis; vaginitis; stomatitis; septicemia which may affect any organ of the body; arthritis; periostitis; endocarditis and other cardiac lesions; epididymitis; nephritis; and so on.

What has been said above as to the professional secret in cases of syphilis when there is question of marriage holds for cases of gonorrhea when the condition is acute. In any case the gonorrhœic should be warned of the possible danger to the innocent second party from a latent infection.

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## ARE VENEREAL DISEASES CONTAGIOUS?

BY

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The absurdity of the above question is so apparent that no great mischief can come from asking it. However, it is no more absurd than the general attitude of the public toward venereal infections as distinguished from infections of other sorts.

One of our states provides that any person decently clad, orderly in behavior, free from contagious disease, who is provided with legal transportation, may go at pleasure upon all lines of public travel. In the popular mind a contagious disease is one whose best known characteristic is manifested upon the surface of the body in the form of an eruption, such as measles, scarlet fever and smallpox. Diphtheria, syphilis, gonorrhea, and tuberculosis are hauled freely all over the country, generally without recognition and seldom with protest from any source. The germs of typhoid and tuberculosis are freely discharged over

the railway roadbeds from Portland to Los Angeles, there to mingle with the dust that is so freely whirled up in clouds by the modern express trains as they fly past at high speed every hour of the day and night. I know of no line of railway that makes the slightest effort to curtail, far less to abolish, this wholesale method of distributing infection. The urine of typhoid patients is notoriously laden with infectious elements, yet it is permitted to flow as freely as the dews of Heaven in railway trains and other public places without a single thought of its dangers to public health. Metal cuspidors reeking with countless millions of tubercular bacilli are dumped here and there with as little thought of danger as a child exhibits when tampering with a loaded firearm. The so-called "Spitting Nuisance" has been greatly modified within recent years, but the enormous dangers of promiscuous, not to say "uncensored," defecation and urination pass with little or no protest from any quarter. I have long had in mind certain practical suggestions concerning drastic measures for destroying infectious elements in railway cars, but shall not pursue the subject further in the present paper.

That the venereal infections are communicable in a high degree is so apparent that it is useless to dwell upon it further. None questions a fact so transparent and so terribly demonstrable even to the dullest minds. Should the victims of acute diseases of this character be permitted to roam over the country at will, using public toilets, and making use of the same tableware used by the healthy? The public drinking cup is still very much in evidence, and within recent months I have seen victims of syphilis and tuberculosis make free use of it. Dismissing all doubtful cases, I have

seen primary lesions of syphilis appear on the lips whose presence could be accounted for in no other way than by contact with some article of infected tableware. A young man of 22 had a cinder removed from his eye by an infected companion and promptly lost his eye from purulent inflammation. Fifteen years ago my attention was attracted to a young man occupying a seat near mine who rubbed his eyes frequently and complained of intense pain. Recognizing the character of his infection I instituted within a few moments the most energetic treatment and within two hours placed him in charge of a skilled specialist, but total blindness followed in spite of all we did. He had used a towel in common with some companions, one of whom was known to have acute gonorrhea. In 1898 I found a primary syphilitic sore on the lip of a girl of 9 years. How it came there I never could learn, but a relative who lived in her family was a known syphilitic.

There are some phases of this subject that are supremely revolting, from which even the wholesome imagination recoils in disgust, yet they must be met with in a spirit of pure science and dealt with precisely as we deal with other unpleasant problems of our art of healing. No matter what may be our opinion concerning primary involvement of the genital tract, it is certain that extra-genital lesions may attack the innocent and as scientific practitioners I hardly know by what authority we depart from the methods of the helpful clinician to assume those of the sheriff and the jailer. As to rational measures of prevention, however, we are bound by obligations of citizenship to do our utmost to destroy infection in its cradle rather than lament the fate of those whom it sends to their graves. During the past generation there were many

learned and unselfish physicians in our Southern States, but until the source of yellow fever was determined all their learning and skill availed but little in waging war against it. So long as flies are bred by the millions and killed by the hundreds we may expect the appearance of those diseases notoriously carried by the housefly. And so with many other diseases.

Venereal infection is viewed as a "private" matter, which in one sense it is, precisely as smallpox is decidedly a private affair with its victim, but the public has the undoubted right to say, "Thus far and no farther shalt thou go!"

A distinguished lawyer and publicist contracted smallpox from a fellow passenger in a railway coach. Arriving at home very ill, he communicated his suspicions to his family, took up his abode in an outhouse, and maintained himself under faultless isolation for a month, when he came forth with "a clean skin and a clear conscience" to resume his usual duties in society. The liberal use of fire and chemicals left no chance for any infectious material to spring from his case.

Quite different were the methods of a wretchedly diseased woman who in the face of vigorous but futile protests traveled over three or more States, displaying much finery and considerable exterior refinement but leaving in her wake an amount of suffering beyond human calculation. She told me in perfect sincerity that she had no dread of syphilis provided it left no disfigurement upon her wonderfully attractive face! Not that she was malicious, but she loved excitement and adventure, was fond of high living and sparkling wines, and threw conscience and consequences to the winds that she might gratify her fleeting but fatal passions. I have no question whatever that

she infected scores of victims with diseases whose scars linger to this day.

Possibly it is impracticable to prevent all travel upon the part of infected persons, but some sort of traveling passport ought to be devised that will set forth the real facts in every case and which would in large measure protect the innocent from all danger of questionable contact with them. No definite reform can, however, be hoped for unless the medical profession shall appreciate the necessity of radical measures of relief and demand legislative action at once rational and effective.

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## DISTURBANCES OF MICTURITION.

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Before discussing the disturbances of urination, it is advisable to give a brief sketch of the mechanism of micturition, so that we may better understand the clinical and pathological significance of the various symptoms, and of their grouping.

The urine is secreted by the kidneys. It is discharged into the bladder which serves, first as a reservoir, then as the propulsive power which expels the urine.

Two sphincters guard the exit from the

bladder: the internal is involuntary and consists of muscle fibres of the bladder wall encircling the mouth of the bladder; the external is voluntary, and consists of the compressor urethrae or cut-off muscle, which surrounds the membranous urethra.

The bladder is quite insensitive to touch but responds readily to the sense of tension. The amount of urine that the bladder holds before the tension makes itself noticed, is usually eight to twelve ounces. The bladder contracts slightly in response to this stimulus of tension, the internal sphincter relaxes, and a few drops of urine pass into the prostatic urethra. This is the most sensitive part of the canal and a stronger desire to void is felt immediately. The external or voluntary sphincter which perhaps is also in part involuntary, opens, and the bladder contracts, forcing the urine into the urethra.

When the last drops of urine enter the prostatic urethra, the deep and the accessory urethral muscles, including the prostate, levator ani and the compressor urethrae contract from behind forward, like a piston, forcing the urine into the urethra.

The submucous coat of the urethra contains spongy tissue. The muscular fibres encircling the urethra with its spongy tissue, take up the wave-like contraction, squeezing forward the blood in the cavernous tissue within its grasp, thus forcibly obliterating the space of the urethral canal from behind forward, and expelling the last drops of urine, in this way preventing dribbling.

Disturbances of urination include:

- (1) Retention of urine.
- (2) Difficult urination.
- (3) Incontinence.
- (4) Frequent urination.
- (5) Infrequent urination.
- (6) Painful urination.

Hematuria, hemoglobinuria, pyuria and chyluria, will not be discussed in this pa-

per, since they do not constitute disturbances of the act of urination.

Retention of the urine may be due to:

- (1) Paralysis of the expulsive power, or
- (2) Some obstruction in the urinary passages.

Paralysis of the expulsive force of the bladder, is due usually to some disease of the central nervous system, generally tabes or myelitis. It may result from overdistension..

Obstruction to the flow of urine is due to the closing of the lumen of the urinary canal. This may be the result:

Of the presence of some foreign body in the canal,

Of the thickening or contraction of its wall,

Of a growth in its walls, or

To pressure on the canal from the outside.

The obstruction may occur at any point of the urinary passage.

At the bladder it is due to impaction of a calculus or blood clot in the internal meatus.

At the prostatic urethra, it is due to hypertrophy or inflammation of the prostate, tumor or prostatic calculus.

In the anterior urethra, to stricture, to an impacted calculus or to pressure from without as by a peri-urethral abscess or extravasated urine. It may be the result of a reflex spasm of the sphincter which occurs after operations on or about the genitals, sometimes after operation on a distant part. Reflex spasm often makes it impossible for a nervous person to void urine in presence of another. Retention may set in suddenly or slowly.

Sudden retention is commonly the result of an acute congestion complicating a chronic inflammation, usually a stricture or a chronic prostatitis. This is often brought on by exposure, by alcoholic or sexual ex-

cess. It may result from an acute prostatitis with abscess. It is sometimes due to impaction in the internal meatus of a calculus or of a fringe of a tumor.

A slowly developing retention comes with a slowly contracting stricture or with a chronic prostatitis.

Retention may be complete or partial. In complete retention no urine at all is passed. In partial retention, some of the urine can be passed while some is retained.

The mechanism in this condition is simple. The floor of the bladder behind the internal meatus forms a pouch, from which the urine cannot be expelled, because it is on a lower level than the mouth of the bladder. The pouch may form behind an hypertrophied prostate, or in a paralysed bladder in which the bladder wall is too weak to overcome the force of gravity.

**Duration of the retention:** This may be temporary or permanent. Temporary retention is due to:

(1) An obstruction by an impacted calculus or other foreign body.

(2) To an acute congestion complicating a stricture or a chronic prostatitis, or to any such temporary condition.

Permanent retention comes with a permanent condition like:

(1) Stricture.

(2) An hypertrophied prostate, or

(3) Paralysis of the bladder wall.

#### DIFFICULT URINATION.

Here the urine can be passed, but with difficulty. The stream may be delayed, or it may be stammering, stopping several times during the act of voiding, or undue force may be required to expel the urine, often in a weak stream.

The causes in general are similar to those of retention, but of milder degree.

In the bladder we may have:

(1) Weakening of the bladder wall, due

to extensive infiltration as with tumor or pericystitis.

(2) Interference with contraction of the bladder.

- (a) By calculi in its cavity.
- (b) Adhesions due to some pelvic inflammation, or by
- (c) The pressure of a displaced organ, cyst, inflammatory mass, etc.

(3) Momentary obstruction of the internal sphincter by a small vesical calculus or a piece of tumor washed up against it by the stream of urine, interferes with the stream giving a "stammering" urination.

In the prostatic urethra we have as in retention, calculi, tumor, inflammation and hypertrophy.

In the anterior urethra, we have stricture, impacted calculus which partly obstructs the lumen, peri-urethral abscess and urinary infiltration.

A tight phimosis may interfere with the stream.

Reflex spasm of the external sphincter may be responsible.

Examples are: Inability to pass water in the presence of a second person, and stammering micturition in spinal disease.

## INCONTINENCE.

Incontinence is true or false.

In true incontinence, no desire to urinate exists; the urine passes involuntarily, sometimes without the patient being aware of it. In false incontinence, the desire to urinate is so strong that the patient cannot resist. It is really "imperative urination." This is most common with tubercular ulcerations of the bladder, near the internal meatus. It sometimes occurs with acute posterior urethritis, and with "fits of stone."

The direct cause of true incontinence is inefficiency of the sphincter, either by weakening or by paralysis or from mechanical interference with its function.

The weakening or paralysis may be due to:

- (a) Exhaustion from persistent stretching or traction on it.
- (b) Paralysis of the sphincter.
- (c) Bruising of the sphincter during childbirth, or during its mechanical dilatation.
- (d) Atrophy of the sphincter in the aged, or
- (e) Injury of the sphincter during operation.

Mechanical interference with the sphincter occurs with:

- (a) Impaction of a calculus which does not completely obstruct the passage, or with
- (b) Infiltration of the sphincter, commonly tubercular, or with tumor growth.

The state of the bladder varies widely in incontinence.

(a) It may be overstretched from the large amount of urine it holds due to inability to empty itself.

(b) It may never be distended, the urine flowing out as soon as it enters the bladder, or

(c) The bladder may hold a normal amount, but is reflexly emptied, without the voluntary sphincter being able to control the stream, or

(d) Both the bladder and the sphincter are paralyzed, the bladder holding urine which can be expressed by pressure, without resistance of the sphincter. The pressure is usually exerted by a displaced uterus, etc.

Clinically, we find the following types of incontinence:

(1) Dribbling.  
(2) Reflex incontinence: Enuresis nocturna and essential enuresis.

(3) With diminished reflex: The bladder does not empty itself, but is easily emptied by pressure on it.

Dribbling: This is commonly found with overdistension of the bladder. The steady persistent tension of the accumulating urine, retained because of some obstruction or the weakness of the bladder wall, finally overpowers the resistance of the sphincter or of the obstruction and the urine overflows.

Cases are seen where the urine dribbles out as soon as it enters the bladder, the bladder not being distended at all.

Dribbling of a few drops after urination, which we find with stricture of the anterior urethra and with infiltration of the urethral muscles cannot be considered incontinence.

Reflex incontinence occurs in :

- (1) Hysteria.
- (2) Enuresis of children.
- (3) As essential enuresis.

In enuresis of children, there is always some discoverable cause. There is usually some irritation about the privates, the anus or rectum. A list of such conditions will include a tight prepuce, a congenital stricture, irritating urine, thread worms, etc. It seems to be due in some cases to enlarged tonsils and adenoids, probably from the semi-asphyxiation induced by them during sleep. It is sometimes present with attacks of petit mal. When enuresis persists in adults we suspect epilepsy.

Essential enuresis differs from enuresis nocturna, in that we can discover no cause. This does not mean that there is no cause, it only means that we do not know the cause.

Those cases of incontinence in which we find neither obstruction nor reflex, are due to disease of the central nervous system, usually tabes or myelitis.

#### FREQUENT MICTURITION.

Frequent micturition is due either to :

- (a) Increase in the amount of urine.
- (b) Diminished capacity of the bladder.
- (c) Increased irritability of the bladder,  
or
- (d) To reflex causes.
- (a) Increase in the amount of urine—  
polyuria—may be non-pathological, as a result :
- (a) Of excessive ingestion of fluids,

diminished sweat, the action of diuretics, etc.

(b) It may be pathological but not due to disease of the urinary organs, as in diabetes mellitus, diabetes insipidus or hysteria.

(c) It is a symptom of pathological conditions of the urinary organs, as in any mild irritation of the kidneys, in interstitial nephritis, tubercular kidney, renal calculus, etc.

It may be noted here, that with frequent contraction of the bladder due to any cause, the secretion of the kidney is reflexly increased.

(b) Diminished capacity of the bladder: The capacity of the bladder may be actually diminished, as a result of operation on the bladder; of chronic cystitis with a pericystitis where the bladder wall and the fatty tissue about it have undergone a sclerosis with great thickening and contraction; of pressure on the bladder by a displaced or enlarged pelvic organ, or the bladder may be congenitally small.

In partial retention, the bladder holds considerable urine, but part of this cannot be emptied spontaneously, the space left for transient urine being therefore diminished.

(c) Increased irritability of the bladder: In the study of frequent urination, we may consider the bladder and the posterior urethra together. The trigone is the most sensitive part of the bladder, as the posterior urethra is of the urethral canal. Any congestion or inflammation of these parts increases their irritability. The result is frequent urination. The cause may be a simple cystitis, a posterior urethritis, congestion behind a stricture or about a tumor, tubercular ulceration, irritation of a calculus, etc. The nearer the process to the internal meatus and the prostatic urethra, the more severe are the symptoms.

Another class of causes of increased irritability of the bladder, due to local conditions, is interference with the distension of the bladder wall by adhesions or by pres-

sure on it. In some instances, where the affected organ that presses on the bladder is painful, the pain felt at the bladder increases its irritability.

(d) **Reflex causes:** Another cause for frequent urination, and a most important one, is a reflex from the kidney. The condition at the kidney may be stone, tuberculosis, or an infection of the organ. Keyes believes that the painful, frequent urination found with such kidney conditions, is due to the action of irritating urine on the bladder.

To give some idea as to the relative frequency of the causes of frequent micturition, we will give a list of 240 consecutive cases from the clinic of Dr. Guiteras at the Post-Graduate. Among 127 patients who each presented a single cause:

- 46 had urethritis.
- 25 had stricture.
- 23 had prostatitis.
- 10 had seminal vesiculitis.
- 7 had cystitis.
- 5 had prostatic hypertrophy.
- 2 had movable kidney.
- 2 had tumor of the bladder.
- 2 had vesical calculi.
- 1 had a contracted bladder and
- 1 had a dilated bladder, but with diminished capacity for transient urine.

Among 123 patients who each presented more than one possible cause for this symptom:

- 80 showed prostatitis.
- 73 showed seminal vesiculitis.
- 46 showed cystitis.
- 43 showed urethritis.
- 38 showed stricture.
- 6 showed prostatic hypertrophy.
- 5 showed prostatic abscess.
- 5 showed nephritis.
- 4 showed pyelitis.
- 3 each showed pyelonephritis, renal calculus and tumor of the bladder.
- 1 each showed ulcer of the bladder, and
- 1 each showed sarcoma of the prostate.

The time of the increased frequency,

whether diurnal, nocturnal or both, is of great significance and aids in the diagnosis as to the cause.

We can easily understand that frequency is increased during the time of the day when the normal activity or the lack of activity causes an increase in the congestion of the bladder or the prostatic urethra; that when the congestion or the irritation is diminished, the frequency is lessened; that when the causes of the increased irritability persist day and night, the frequency will be present day and night.

We can see why in cystitis where the congestion is relieved by rest, frequency is diurnal. With vesical calculus this is more marked. When the patient is up and about, the stone is lodged on the sensitive trigone which is the most dependent part of the bladder. When the patient is on his back, the stone rolls away from the sensitive spot.

Tubercular ulcers on the trigone give continuous irritation by day as well as at night, the frequency is therefore present day and night.

On the other hand, with prostatitis, the frequency is present chiefly at night, because the dilated veins of the prostatic venous plexus, which are compressed by the action of the perineal muscles when the patient is about are much more congested when the patient is at rest, that is at night.

#### INFREQUENT URINATION.

Besides the diminution of urine present with acute inflammation of the kidneys, congestion of the kidneys, fevers, and excessive sweating, we have calculus anuria, which is probably due to a reflex inhibition of one kidney when the excretion from the other is suddenly stopped as by an impacted calculus. It should be mentioned that in practically every case of calculus anuria that

terminates fatally, the second kidney is found to be badly damaged also.

Reflex anuria may be met with after operations, sometimes after slight interference with the urinary tract, such as the passage of a sound, and with hysteria.

#### PAINFUL MICTURITION.

This may be due to three kinds of causes.

(1) To increased sensitiveness of the urinary passage; to congestion, inflammation, or ulceration whether from simple cystitis, urethritis, calculus, tumor or tuberculosis. The intensity of the pain depends on the acuteness of the inflammation.

(2) Another cause is the passing of irritating urine; the urine containing an excess of uric acid, phosphates, or oxalates, sometimes irritating drugs.

(3) Another and a most important cause is reflex irritation of the bladder from the kidney or ureter. This is a common symptom with renal tuberculosis and calculus, while the bladder appears to be perfectly normal.

The time of occurrence of the pain in relation to the act of urination, should be noticed. An acute posterior urethritis will give most pain at the beginning of the act, because of the sudden distension of the inflamed tube by the stream of urine, and at the end, from the contraction of the muscles squeezing out the last drops of urine. With cystitis the pain is chiefly at the end of urination when the inflamed bladder wall contracts on itself.

The location of the pain may also help to suggest the conditions. The pain of a calculus is usually reflected to the glans, while the pain in trigonitis and prostatitis is mostly felt in the perineum at about the mouth of the bladder, and in the rectum. The pain of a diffuse cystitis is occasionally felt in

the hypogastrium. Other locations where pain may be felt are, the groin, loin or even the thigh.

#### ELECTROTHERAPY AND ELECTROTHERAPIST.<sup>1</sup>

BY

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*Electrotherapy* is the application of electricity to the human body for the purpose of alleviating or assisting in bringing about recovery from disease.

An *electrotHERAPIST* is a person skilled in the art of applying electricity for curative purposes.

There is no science with which we are familiar, concerning which we know so much, and at the same time so little as the science of electrotherapeutics.

That the application of electricity to the human body has certain clearly demonstrable effects is everywhere conceded.

When a faradic current is passed through a normal nerve or muscle, we notice a contraction of that muscle. That muscle remains in a state of tonic contraction as long as that current flows through it.

When a galvanic current is passed, under similar circumstances, a contraction occurs only at the very moment that this current is closed or again opened. During the period of flow there is no contraction.

When a high frequency current is passed thru living tissue, all direct electrical effects are lost, and instead of them the electrical energy is converted into heat energy.

In laboratory tests the faradic current is

<sup>1</sup> Read at the meeting of the N. Y. Society for the Promotion of Physical Therapeutics, Nov. 15th, 1916.

incapable of causing chemical changes in compound substances, while the galvanic current decomposes everything thru which it is passed and the high frequency current simply imparts heat to the same substances.

Three main sources of electric modalities are recognized viz.: galvanic, faradic and static. From these three fundamental sources we have thirty-six derivatives. Almost daily new changes and new combinations are added to this number. In fact they spring up like mushrooms over night. That each and every one of these various modalities exercises a certain positive physiologic effect upon tissues can not be denied. It is an unfortunate fact in the practice of medicine that a certain new and untried agent is today lauded to the skies, while tomorrow it sinks into a usually well deserved oblivion. Electric modalities are no exception to this rule.

Altogether too many physicians make use of electric currents and their applications for no other reason than the mysticism which seems to be inseparably connected with them; they seem to think that electricity possesses some magic power to heal or to cure something. The fact that electric modalities obey certain absolute laws of physics never has entered their mind. Many times anatomy, physiology and pathology are left out of all consideration when electricity is applied. *Electricity never has and never can cure anything.* Electricity is a natural force, it is energy.

By the law of the conservation of energy, electricity energy can be transmuted into any other kind of energy as heat, light and motion. Such energies as heat, light, and motion are requisite to all manifestations of life.

During health or disease the organism responds in a certain well established manner

to the application of the various electric modalities. If these responses are of the right kind they may assist the remaining normal cells or even diseased ones in overcoming a pathological condition. If the modality applied is not in harmony with the existing physiology and pathology of the part, beneficial results can not be expected. The fault then does not lie with electrotherapy, but with the electrotherapist.

In the October number of "*American Journal of Electrotherapeutics and Radiology*" appears "Presidential Address" by J. D. Gibson, Denver, Col. This address consists of about 3,500 words. It is supposed to embody the perpetuated old as well as things new in the electrotherapeutic world. If the medical readers will take the trouble to peruse this article carefully they will find much food for thought.

"I say my method, because by this method, namely: the adding of X-ray for its direct and specific effect upon the bacilli and the lung tissue or cells of the lungs; static electricity for its direct effect upon the heart, nervous condition and general metabolism; and inhalation of an ozonized oil nebula for its effect on the cough, added to the ordinary dietetic, hygienic, climatic, rest and medicinal care as is generally used in the treatment of pulmonary and other forms of tuberculosis, etc."

The lines quoted contain the only reference made thruout the entire address of any electro or other therapeutic agent or of any other disease treated by these methods.

Rather than make any detailed comments upon the treatment of tuberculosis as outlined in the above quotation, I prefer to leave it to the tender mercies of the reader.

Just think of it, X-rays, ozonized oil and static electricity in tuberculosis are all that is offered to the American Electrotherapeutic Association at its 26th annual meeting by its retiring president. Such modalities as

faradic, galvanic, sinusoidal, high-frequency or diathermia have been entirely forgotten,—perhaps have never been known.

Instead of making mention of such measures Doctor Gibson recommends "The Health Board or Commissioners should have a department for this special school work, known as the *Tubercular Department*. \* \* \* \* \*." Just what is meant by a "*Tubercular Department*" I am unable to say but evidently this *Tubercular Department* knows what it is about, for later on we read "They (*Tubercular Department*) have established *tubercular camps* and hospitals."

"Every child that is *tubercular* or shows a reaction or sign of tuberculosis, should be treated by my method of treatment and cured while it is attending school. *Segregation will be unnecessary.*" In another part of the address we find the reason for this statement.

"The reason that the schools be supervised and managed in this manner by the health board is, first that the Board of Health would have unquestioned authority behind it. It can enforce its mandates and secure the treatment for *tubercular children* the same as it does vaccination and *in matters of quarantine it would be supreme.*"

Evidently because "*segregation is unnecessary,*" it must be referred to the Board of Health as "*their power in matters of quarantine is supreme.*"

Doctor Gibson informs us "Tuberculosis in all its combined forms is the great plague of the age. In our own land there are 200,000 deaths every year." Yet a little later we read "Another reason is that few physicians will be willing to make the outlay of money necessary to prepare them for this work and spend their time to become familiar with the methods for the few local

cases they may be called on to treat. Nor would every doctor be likely to get patients enough for him to become proficient in the work."

Not alone do we read of *Tubercular Departments, tubercular camps, tubercular glands, tubercular conditions* but we have *tubercular children.*

The whole presidential address shows an utter disregard for everything that is electrotherapy or other scientific medical matter. It is most unfortunate that every once in a while something happens that is bound to turn the wheels of progress backward.

Electrotherapy requires a thoro understanding of electro-physics and electro-physiology. There are many physicians practicing electrotherapy who have received their entire knowledge from the electric instrument manufacturer.

Electrotherapy like any other therapeutic measure is based upon sound underlying principles. There is however a wide difference between electrotherapy and electro-therapeutist.

#### ADDENDUM.

Since writing the above criticism, an article that purports to be the same "Presidential address," by Dr. Gibson has appeared in the *N. Y. Med. Jour.*, Nov. 25th, 1916.

In this journal the address received the additional title "The Speedy Cure of Tuberculosis."

Upon comparing the two articles, that while they are practically identical, the article in the *N. Y. Med. Jour.* contains no less than *one hundred and thirty-seven corrections.* Most of these corrections cover points in grammar, some of them in rhetoric and not a few of them are corrections of misstatements of facts.

In my original criticism the therapeutic merits were not touched upon. Had such measures been recommended in any other disease but tuberculosis one might be

tempted to smile and trust to the good judgment of the reader.

In "The Speedy Cure of Tuberculosis," lurks a serious danger. The average victim of this disease, like a drowning man is willing to grasp at a straw. To mislead such a patient either intentionally, thru ignorance or to put into the hands of the unscrupulous even a suggestion, by which they might be induced to fleece such sufferers, is little short of criminal. In looking over "The Speedy Cure for Tuberculosis" I find in there one redeeming passage, "*I maintain that by this method it is possible to eradicate and cure every case of tuberculosis in adults and children, when detected in the early or pre-bacillary stage.*" In other words Dr. Gibson cures tuberculosis before it exists. So if Dr. Gibson applies "*my method*" only to cases that have not had, probably never will have tuberculosis, there will not be many cures made.

Dr. Gibson says "*my method, because by this method, the adding of X-ray for its direct and specific effect on the bacilli.*" Why must a "direct and specific effect upon the bacilli" be had when the cases are treated in the "prebacillary stage?" In 1905 this same system was thoroly tested at Cornell University Medical College. After trying it on a little over three hundred cases, this system was discontinued in 1908. We did not use the X-ray however in the "prebacillary stage" but as a rule we were able to verify our diagnosis of tuberculosis by finding the bacilli in the sputum.

Dr. Gibson uses "static electricity for its direct effect upon the heart." For nearly a quarter of a century I have made use of static electricity, but have never found anywhere any statement that static electricity has any "direct effect upon the heart." I therefore deny the "direct and specific effect of the X-ray upon the tubercle bacillus" as well as the "direct effect of the static electricity upon the heart."

Dr. Gibson further recommends "inhalation of an ozonized oil nebula for its effect on the cough."

"By the manufacture of ozonizing machines ozone has been vaunted as a valuable remedy in many diseases—as an effective room disinfectant, as a purifier of the air and a restorer of exhausted human vitality. How misleading and even mischievous such

claims are is shown by the detailed investigation and discussion of the ozone question by Jordan and Carlson. Ozone is a toxic gas. So far as the evidence goes, ozone produces no reaction in the human organism or in the lower animals that can be regarded as in any degree beneficial either in combating or in warding off infectious disease. On the contrary, all appreciable, physiologic change produced by the inhalation of ozone is of no practical importance \* \* \* \* \* The experiments of Jordan and Carlson are independently confirmed by the work of Sawyer, Beckwith and Skolefield. \* \* \* \* \* The results of all scientific investigation of this subject, in fact are in substantial accord. \* \* \* \* We agree with the authors cited in the statement "it is probable that the injury to the respiratory tract by ozone in sufficient concentration to act as an effective mask is of greater moment than the deleterious action of most odors." (The truth about ozone, editorial *Jour. Amer. Med. Ass.*, Sept. 27th, 1913). Further comment upon the "ozone nebula inhalation" would be superfluous.

When we sum up Dr. Gibson's treatment for tuberculosis we find that it consists of the addition of X-ray, which was discarded as useless for pulmonary tuberculosis by Cornell Medical College in 1908; the use of static electricity for its direct effect upon the heart which is a myth; and the inhalation of an ozonized oil nebula which has been condemned as not only being useless, but positively harmful. Such recommendations border upon the ludicrous were it not for the pathetic side of it.

The whole "Presidential Address, The Speedy Cure for Tuberculosis" shows an utter disregard for scientific facts, a complete lack of comprehension of what tuberculosis is and it recommends therapeutic measures that savour much of the quack and nothing of a graduate in medicine.

In the *N. Y. Sun*, Nov. 5th, 1915, appeared a three column article by Dr. Gibson detailing the sure cure of tuberculosis and prophesying "there will be no more tubercular specialists." The entire Presidential address is here given with photographs showing patients receiving the much vaunted X-ray, ozone inhalations and static treatments. The medical journals could have saved their space for other more profitable

reading because the profession as well as the public had an opportunity of becoming acquainted with the "Speedy Cure of Tuberculosis," by reading the *N. Y. Sun* one year ago.

231 W. 96th St.

## ETIOLOGY OF ENDEMIC GOITRE.

BY

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During the past twenty years I have sought the cause of the endemic goitre which is so frequently met in this district. It is especially common in families resident along the course of two small streams, being found practically in every household, and as usual most frequently in females. Likewise I have seen it in all the domestic animals in this section, and in one of the streams I have caught fish with enlarged thyroid glands. I have seen several children born with goitre and in every instance the mother was goitrous. I attended two pregnant women with severe dysentery in September, both were threatened with abortion, but were successfully carried thru to full term to give birth the following February to goitrous babies. The question naturally arises: "Did the damaged placenta allow some infective agent to filter thru and affect the fetus?"

Is goitre due to the chemical constituents of the water? I think not, for then it should affect every person using the water. I found residents of certain houses affected, rather than those using water from certain wells. This might suggest personal transmission thru an intermediary host, but again investigation showed that these houses were inhabited by the people of the second and third generations born in the district.

The theory of an excess of lime in the water being the cause of goitre is very plausible in this district as we here have extremely hard water which drains thru a limestone formation, but how does it account for goitre in the granite districts of northern Ontario where there is no limestone?

In my younger days I was interested in dogs and tried to breed good fox terriers for bench purposes, tho with little success. I found that I had to import new sires constantly, as the second or third removes from imported stock were goitrous scrubs without stamina. In 1902 a bitch gave birth to a litter every one of which had congenital goitre. I have seen litters of pigs affected in the same way. This bitch was bred from imported stock, she herself had a small goitre. The sire was bred locally. Looking for some cause for the condition I noted that she was passing worms in the stools. On giving an anthelmintic she passed some huge masses of worms. I then made a microscopic examination of the alvine secretions of the dam and of the puppies. I found no worms in the puppies but I did find ameba present in stools of both mother and puppies. Further investigation shows ameba present in the intestinal tracts of all the domestic animals and man in the goitrous district.

Ameba are present in the drinking water, but are they the same ameba? Is the individual infected directly from the water? I think not, because the town of Walkerton is supplied with water from the same springs which feed the two small streams mentioned and previous to the installation of water works and closed sewage system twenty-five years ago, goitre was very common in the town. With installation of water works and closed sewage systems, goitre became less common in the town but has increased along these streams. This suggests

an intermediary host feeding upon the alvine secretions and then infecting the vertebrates. The culex mosquito feeds upon feces and also upon all the vertebrates. But remember this is only a suggestion. Many flies do the same.

(Just while writing this article to-day Mr. J. B., a farmer living on a farm on one of the two small streams mentioned, brought his daughter in to consult me about a simple goitre, and in our conversation he told me that during the past year two colts and four calves had been born on his farm with congenital goitre and two sows had given birth to goitrous litters. He remembers distinctly that both of them had severe attacks of diarrhea during pregnancy and some other hogs died of it at the time).

From this investigation I have learned that all vertebrates in this district are subject to goitrous degeneration, but that certain types are more resistant than others. I can best illustrate this by my experience in breeding dogs. A pair of terriers is imported from England and bred, the first litter are fine, vigorous specimens. Subsequent litters not so good, and as they mature thyroid enlargement is quite frequently observed. This generation is bred with other native bred dogs of the same breed. The evidences of thyroid degeneration are much more marked in their progeny. The progeny of the third generation are mere goitrous scrubs, but by breeding with imported sires the goitrous degeneration can be kept at a minimum.

Now to explain what I mean by saying that certain types are resistant. I had noted that fox hounds bred in this district rapidly degenerated, with the exception of one strain, a fine large black and tan variety which seems to breed always true to type and is vigorous and virile. On investigation I found that this strain was developed by the late Judge Barrett about forty years

ago from a cross with a Gordon setter. This strain is virile and vigorous whilst the light colored thin skinned varieties rapidly degenerate and become goitrous. The same phenomenon is observed in a herd of polled Angus cattle owned a few miles from here. (A dark thick skinned variety). Whilst I have noted rapid degeneration of Jerseys, Ayrshires and other light skinned breeds, in human beings goitrous degeneration is more marked in families of the blonde type. Breeders of live stock neutralize this tendency to goitrous degeneration by the constant importation of sires from their native habitat. The same foresight is not used in breeding human beings.

That these signs of degeneration are not alone confined to the thyroid gland I will quote the remarks of an old German butcher after slaughtering some scrub sheep. "They have little livers, little hearts, and little lights, and their casings are not strong enough for sausage." In other language the engine is not heavy enough to run the machinery.

Let it be granted that goitre occurs in all vertebrates in the goitrous area and that amebic infection occurs in all, yet many individuals with amebic infection show no sign of goitre. Can amebic infection be the cause of goitre? This country was settled in the late fifties mainly from Scotland, Ireland and Germany. My father started practice of medicine here when he left the American army in 1865. Amongst the first settlers goitre was uncommon, but their families showed thyroid enlargement very frequently and marked thyroid degeneration is very common in those of the third and fourth generation now inhabiting the country. We have a widespread amebic infection which is not regarded as pathogenic.

In the proceedings of the American Association for the Advancement of Science

Professor Ward says: "It has frequently been noted that parasitic infestation tends to retard the development of the host organism. In fact it does not hinder the general growth of the host strikingly, but arrests primarily its sexual development. This has been especially investigated by Alfred Girard who denominates the phenomenon parasitic castration and defines it as the sum total of modifications produced by parasites upon the reproductive apparatus. The phenomenon appears to be widespread, instances being found in all branches of the animal kingdom and as the result of the most varied parasites." Eccles, *Med. Record*, Nov. 1909.

The new settlers came to the district as adults and made a vigorous resistance to the infection. The second generation were early infected but usually show only simple hypertrophy of the gland. The third generation show marked thyroid degeneration, in fact are often goitrous scrubs without vitality, virility or ambition. The first settlers usually had large families. These families married but their families were smaller; during pregnancy the sufferings of the mother were greater than those of their mothers, parturition more difficult. When their children marry pregnancy is a period of suffering and danger, and parturition is often equivalent to a capital operation.

Amebic infection, I believe, is the cause of the decreasing birth rate, and follows the biologic law of parasitic castration. This law works until a type is developed which is resistant to the infection and they become more fertile than ever, e. g., the French Canadians.

During the French regime 480,000 French came to Canada. When Canada was ceded to Britain they were represented by 65,000 more or less mixed with Indian blood, and

their descendants amount now to about 3,000,000.

That amebic infection is the cause of goitre I have proved to my own satisfaction at least, for I have developed a line of treatment which eliminates these amebae from the system, and with elimination the enlarged thyroid is restored to normal size. With elimination of the ameba women who have been sterile for years have given birth to healthy children. I found no success in treating these cases with ipecac or ipecac derivatives. I have treated many cases of exophthalmic goitre successfully by my method.

Goitre does occur in first settlers in the district but it is rare. It is very common amongst the second generation. Thyroid degeneration occurs earlier and is more marked in the third generation.

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## THE DIAGNOSIS OF RHEUMATISM (?) AND FOCAL INFECTIONS.<sup>1</sup>

BY

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To confine myself to the subject assigned me, viz.: The Diagnosis of Rheumatism and Focal Infections, would, if I adhered strictly to the meaning of the term, require but little time, and would either deal with the comparatively small percentage of the conditions falling under the general head of rheumatism, or would admit that all arthropathies are traceable to a focus of infection. This I am not willing to admit. Strictly speaking, this is no doubt true, or in a measure true, if we are willing to concede that those conditions not depending upon the

<sup>1</sup> Read before the Kentucky Midland Medical Society, July, 1916.

tonsils, the alveoli, etc., depend upon the intestinal tract, kidneys, liver, etc., for their origin; and even should you admit that, I would still feel greatly inclined to place a large percentage of cases in that class which depend upon the retention within the body of those products of protein metabolism, particularly which the kidney thru its very peculiar mechanism and still more peculiar selective action, fails to eliminate. These products are: uric acid, nitrogen, urea, creatin, creatinin, sugar, etc., and the result of this retention with the consequent damage to the joints, and the tissue surrounding, the pericardium, endocardium, etc., is not an infection but the direct result of a profound metabolic disturbance.

And notwithstanding the confusion and controversy which exists concerning the names suggesting etiological factors, names suggesting pathological and anatomical changes in the joints, names according to the X-ray findings, names suggesting chronicity, etc., the fact remains that the best classification thus far, if we would approach the truth and our actual knowledge of the condition, has only two divisions, (a) the infectious, and (b) the non-infectious.

It is well to remember that altho many new names have been introduced in the last hundred to one-thousand years to designate a joint condition, that as early as A. D. 41 a term was applied to indicate acute joint disease (1). Bones thousands of years old have been found in Egypt with distinct evidence of pathological changes in the joints (1). The term rheumatism dates back to times when physicians believed that harmful phlegm flowed downward from the brain and injured other organs of the body (1). Such a theory had adherents until the latter half of the seventeenth century (1). As early as the sixteenth century the word

"arthritis" was applied to the gouty affections, and the word "rheumatism" to the acute joint diseases. Chronic rheumatism and gout were differentiated as early as 1683 (1).

The basis, then, for our present nomenclature consists essentially of the three words, (a) arthritis, (b) gout, and (c) rheumatism, and dates back to the sixteenth century. Through the three hundred years that have elapsed these three terms have served in various combinations, and with numerous descriptive adjectives and prefixes, to indicate the various joint conditions with which we have to deal. In this confusion of names we find such terms as gouty rheumatism, rheumatic gout, rheumatic arthritis, articular rheumatism, rheumatoid arthritis, arthritis deformans (Virchow, 1869), etc.; and such descriptive adjectives as acute, chronic, progressive, infectious, atrophic, degenerative, inflammatory, migratory, secondary, etc.; and such prefixes as osteo-, poly-, peri-, etc.; but none having to do with any possible etiologic factor.

In later years the words traumatic, hemogenous, lymphogenous, etc., were applied with a more noticeable tendency to establishing an etiologic basis, and finally the latest classification refers particularly to the infecting micro-organisms, when it can be demonstrated as polyarthritis-gonococcica, polyarthritis-pneumococcica, polyarthritis-streptococcica, polyarthritis-staphylococcica, etc. With all this confusion of names, most of them with very definite meaning it is true, leaves us not one whit nearer the goal for which we have been striving these many years, and when reached will convert chaos into order and vagueness into definiteness. That goal when reached will be the answer to the question which for so many years

has baffled physicians "What is rheumatism?"

You will note, and at the same time no doubt wonder, that I still use the term rheumatism. I do not see why we should not use it. To me rheumatism does not mean the same as arthritis or gout, and its adjective rheumatic can be applied to disease of other parts, such as the throat, eyes, serous membranes, muscles, etc., probably due to the same cause as that producing the joint condition, but could not be referred to as arthritic. Until that time, then, when our theories have become facts, and indecision has been replaced by certainty, why discard those terms which mean so little yet which need only to be spoken to impress upon the mind's eye the picture of a condition which is as familiar to the doctors in the remotest corners of the earth, as it is to the one who would now use hematogenous arthropathy, polyarthritis-streptococcica, arthritis tabidorum, and as many more as there are writers on the subject? Until someone can come forward and prove beyond the peradventure of a doubt that he has discovered the cause of the various joint conditions, let us insist that we have had enough confusion, and that plain old-fashioned rheumatism, which was good enough for Virchow, Gerrod, von Volkman, Bradie, and others, is good enough for us.

Along what lines must we work to clarify this confusion? I should say the application of physical, chemical, and biological methods to the study of the various metabolic disturbances (1) which is no doubt the basis of most if not all of the non-infectious types of joint diseases. For the type called infectious, no one can question the results of Rosenow particularly or oppose his contention that in those cases where he has obtained positive results from cul-

tures made from the blood and joints, and was able to reproduce the same condition in other animals, that the cause in this particular case at least was demonstrated. The positive cultural result, however, does not give us the origin of the micro-organism, whether in the tonsil, tooth, colon, or prostate; nor the fact that a similar organism may be isolated from the tonsil, does not tell us that the tonsil is not also a secondary manifestation the same as the joint; nor the fact that a vaccine made from this particular strain will relieve the condition prove anything, since it has now been demonstrated that any foreign protein introduced into the blood stream produces practically identical results with an autogenous vaccine.

Conservatism is now rightfully succeeding a vicious radicalism and few nose and throat men are there, after having practiced the fad for a year or more, but will admit that they have seen numerous tonsils, adenoids, etc., removed without benefit to the existing joint condition. On the other hand, I have seen and you have seen hundreds of cases of joint disturbance relieved by careful regulation of diet, proper hygienic measures, the salicylates in some form, and the removal of the only focus of infection we have known (until the last few years) since the days of Hippocrates,—that existing in the intestinal tract.

In my experience of ten years at one of the popular watering resorts of this country, and which comprises many hundreds of cases of all types of joint disease, the large majority of cures have resulted from such a regime and in many instances after the removal of teeth, tonsils, adenoids, etc., had failed to give relief. I want you to understand that I am heartily in favor of thoroly searching for and removing all foci of in-

fection, not for the purpose of relieving the joint condition alone, but for the purpose of improving the general health.

If a man who has been crazy all his life receives a hard blow upon the head and his reason is restored, the papers for miles around herald the miracle. Do not try, however, recommending this treatment for every lunatic you see, because a thousand other crazy men were probably struck upon the head the same day without this result and of which you heard nothing. You no doubt already see the comparison I shall make.

A person suffers from an acute joint disturbance and has his tonsil removed or his tooth extracted, and his joint condition is immediately relieved. He is naturally very grateful and at every opportunity relates his experience. His doctor is delighted and reports the fact at his various medical societies, and probably records it in a medical journal. But how about the other twelve who had their tonsils and their teeth removed and were not relieved, and finally had to go to bed and have their intestinal tracts thoroly cleansed, and a careful study made of their blood, urine, etc., to determine the body requirements in the way of proper food, all of which produced a cure? You never heard of these, did you, and yet this is true. The one was an acute infectious process, and was relieved by the simple procedure of pulling the tooth or removing the focus. The others were of a different type, the non-infectious, and removing the tooth and tonsil did not help, nor was any focus removed excepting what possibly existed in the colon.

While it is true that most if not all of our accurate knowledge concerning the cause and action of disease is now coming from physiological, bacteriological and bio-

chemical methods, the results of these investigations differ but little from the opinions of those great clinicians and observers of fifty to one-hundred years ago who obtained their knowledge only thru study and close observation of the individual case. Unfortunately such men are rare in this day.

For instance, in Aitkens' "Practice of Medicine," published in 1866, you will find these opinions: Basham, Gerrod and Fuller say: "It acknowledges no general external source, and it is not even demonstrated that any definite offending matter or poison pervades the system. It is presumed, however, by inductive reasoning that some morbid material is generated by and within the bodies of those in whom rheumatism has fully developed, and that it is not absorbed from without." Then referring to the poisoned state of the blood, Budd says: "A phenomenon that obtains in all disorders connected with a vitiated condition of a circulating fluid." Holland and Fuller say: "The phenomena of metastasis when it does occur points to a morbid matter in the blood itself as an explanation of the occurrence." Showing that even previous to 1860 clinicians recognized some joint conditions as being metastatic, and depending upon a focus of infection for its source. Both Craigie and Watson hold that rheumatism implies inflammation of a peculiar and specific kind, and the latter goes a step farther and says: "Rheumatism is a blood disease, that the circulating fluid carries with it a poisonous matter which by virtue of some mutual or elective affinity, falls upon the fibrous tissues in particular, visiting and quitting them with a variableness that resembles caprice, but is ruled no doubt by definite laws to us as yet unknown."

In summarizing the different opinions the author himself says: "Whatever, therefore,

the poison may be which induces the rheumatic state, it is one which appears to be generated within the system as the result of faulty metamorphosis, that many agencies may conduce to the formation of the poison and to its retention within the system."

Please note that these men recognized many agencies conducive to the retention of poisonous matter, and further on Hacke, Graves and Taylor say that "acute rheumatism and pericarditis may coexist without any articular affection." Such opinions approach very closely those resulting from recent scientific investigation, and certainly come nearer hitting the mark for a majority of cases than the unfortunate popular belief of to-day, that the cause of all joint disturbance can be found in the mouth.

Corroborative of these old opinions, and even the "uric acid diathesis" which was adopted with such enthusiasm and later abandoned to make way for another fad, is the work being carried on in the bio-chemical laboratories in the east, and which I have also done in my own laboratory. This work has been principally to confirm the views advanced by Gerrod nearly seventy years ago, with the exception that with quantitative data now available more definite conclusions have been possible.

It is well at this point to quote from Gerrod's work which was published in 1848. The following is verbatim, and was quoted by Meyers and Fine in a recent article published in the *Archives of Internal Medicine* (2). "Uric acid is always present in the blood in albuminuria. The quantity, however, varies. When the function of the kidney is much impaired, it exists in quantities almost as great as in gout. In other cases this amount is small, but it usually exceeds that found in ordinary blood. Urea always exists in large quantities in this blood, and no relation is found between the

amount of urea and uric acid. The kidneys are always deficient in their power in throwing off urea; but with regard to uric acid their excreting function may be impaired or not." That the paper aroused considerable discussion is evidenced by a postscript dated July 26th, 1846, in which he says: "At the discussion which ensued after the reading of the above paper to the society, some remarks were made which implied that I was understood as considering gout to be entirely dependent upon the power of the kidney for the excretion of uric acid. Such, however, is not my opinion, and at present I do not wish to advance any hypothesis as to the cause and nature of gout, considering that many other researches should be made on the subject before a theory of the disease could be advanced with safety." (2) The investigations of Von Jaksch, in 1896, confirmed these observations, and recently Von Noorden, in his "Metabolism—Practical Medicine" confirms Gerrod's observation, and says in brief "that stripped of all unnecessary details, this means the retention of uric acid in the blood, and the remaining phenomena of gout are the result of primary disease of the kidney." The work of Folin and Denis, and others, also confirms this opinion.

In speaking of the "uric acid diathesis," this like many other terms was greatly over-worked, and finally came to be used more as a term to cloak the ignorance of the one using it than to apply to the condition for which it was created, and which really existed, and does exist to-day. Notwithstanding, however, the disfavor into which it has fallen, uric acid is probably responsible for more joint diseases to-day than any other one factor. As to whether the term "uric acid diathesis" is a good one, is doubtful.

Folin and Denis (*Arch. Int. Med.*, 1915, vol. xvi, No. 1) have been able to show that

normal blood contains from 1.5 to 2.5 mgm. of uric acid to 100 c.c. In gout especially and some types of arthritis, this amount is greatly increased. I have been able to demonstrate recently in my own laboratory that several obscure conditions, one especially, of chronic urticaria and asthma of eight years' standing, and without joint involvement, depended upon a great excess of uric acid, running as high as 6 mgm. per 100 c.c. of blood. In such conditions the treatment is practically the same, and the cause the same, as that which in an overwhelming majority causes arthritis, and this condition I would term a rheumatic diathesis, or an uric acid diathesis, for want of a better term in the new nomenclature to adequately convey the meaning.

It is quite interesting and illuminating from a diagnostic standpoint to study the work of Folin and Denis and the tabulation of their results. For instance, the relationship existing between uric acid and the non-protein nitrogen of the blood is used as a basis for diagnosis. The following table will elucidate this point: (3).

	Non-Protein Nitrogen	Uric acid
Infectious arthritis (purin free diet)	89	1.8
Bone tuberculosis (purin free diet)	102	1.6
Acute rheumatic fever (purin free diet)	104	1.7
Acute rheumatic fever (pericarditis)	100	1.6
Arthritis deformans	54	1.2
Arthritis deformans	50	2.0
Infectious arthritis	80	2.3
Arthritis	50	2.0
Acute infectious arthritis	80	1.9

When you understand that the maximal normal limit for non-protein nitrogen in the blood is 30 to 40 mgm. per 100 c. c., you will see that these cases all have a very high non-protein nitrogen but a normal uric acid. Going on to the next table we have the following results: (3).

	N. P. N.	Ur. ac.
Typical gouty attacks for 7 years.	25	3.8
Arteriosclerosis, with acute gout, first attack	40	3.4
Alcoholic gastritis and gout	40	3.5
Gout (many tophi)	30	4.4
Typical gout, last attack 2 years ago	28	5.2
Typical gout, in both great toes	36	5.4
Acute gout	32	3.1

Many other similar.

You will at once see that these cases are characterized by normal non-protein nitrogen but high uric acid content. In other words, the infectious joint conditions show a high non-protein nitrogen content of the blood with normal uric acid content, while the chronic gouty conditions show a high uric acid with a normal non-protein nitrogen content. Then passing on to the next table, we have the following: (3).

	N. P. N.	Ur. ac.
Uremia	288	9.5
Cardio-renal case	326	4.4
Chronic nephritis	148	6.5
Acute gonorrhreal arthritis	124	3.3
Acute gout and chronic interstitial nephritis	60	5.7

In this table the cases are characterized by both a high non-protein nitrogen and uric acid content, and show more than anything else the inability of the diseased kidney to excrete uric acid. The picture of gout and early nephritis, as far as uric acid is concerned, is strikingly similar, and this similarity must be more than accidental. On the other hand, the blood of the acute infectious cases shows a striking similarity to the vascular nephritides with the retention of non-protein nitrogen. It is, therefore, quite necessary in making use of blood analyses to differentiate joint lesions, that not only the determination of uric acid be made, but the non-protein nitrogen or urea as well. The next table, which is a series

of four cases in my own practice, will show the diagnostic value of blood analysis:

(2) There is no good reason for discarding the word "rheumatism," since it ex-

Case	Age	Sex	U. ac.	Urea nitrogen	N. P. N.	Alb.	Casts
N.	41	male	7.4	25.2	95.8	none	plus
G.	40	male	4.8	12.0	28.0	plus	plus
W.	50	male	6.0	8.4	22.4	none	plus
J.	23	female	1.0	84.0	95.2	none	none

*Case 1 (N)* was an obscure condition in which severe general muscular pains were the predominating symptom for a number of years. Practically everything in the way of treatment had failed to give relief. The high uric acid content, with also the high N. P. N. of the blood, shows not only the gouty condition, but an existing nephritis; that is, the inability of the kidneys to eliminate both uric acid and nitrogen.

*Case 2 (G)* was one of severe headaches for a number of years with no joint symptoms. You will note that the blood showed a high uric acid content, but normal nitrogen. Notwithstanding the presence of albumen and casts in the urine, a metabolic study showed that this man was able to take care of normal fluid, salts and nitrogen after a nephritic test meal, and the only abnormality was the lessened permeability of the kidneys for uric acid. The headaches in this case were relieved by proper diet and elimination.

*Case 3 (W)* is an obstinate urticaria and asthma of nine years' duration. Note only the high uric acid concentration of the blood. In this case the teeth were all pulled, and all foci of infection removed, with no relief. The patient is now improving on a dietetic regime alone.

*Case 4 (J)* shows a normal uric acid content, but a low permeability of the kidneys for nitrogen, and in this case the predominating symptom was pain in the back.

In conclusion, then, I would summarize the foregoing as follows:

(1) Increased experience is showing that a comparatively small percentage of joint diseases have their origin in an infection in the mouth, and it has not been demonstrated that even this is not secondary to infection primarily in the intestinal tract, as Dr. Lane insists:

plains many conditions better than any other word in the new nomenclature:

(3) Analysis of the blood is not only a scientific and accurate method for differentiating various joint conditions, but it often reveals conditions that are essentially rheumatic or gouty in character which are not accompanied by disturbance in the joints. And, furthermore, it furnishes us with the basis upon which a rational and intelligent treatment may be established. It also shows clearly the similarity between the interstitial type of nephritis and gout, and the vascular type of nephritis with the infectious joint processes. It is even possible and I dare to predict that the time is coming when the various joint conditions will be looked upon as evidence of disturbed renal function, which in itself, in a certain type, may be due to a focus of infection elsewhere, and which focus when removed will clear up the disturbed renal function by restoration of its permeability for those substances which if retained in the system produce the well-known symptoms of rheumatism.

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Conducted under the Editorial Direction of Dr. J. W. Wainwright.

**Quinoidine in Malaria.**—Waters, (*Indian Medical Gazette*, September, 1916) reports on the merits of quinoidine in the treatment of malaria. This agent is an amorphous mixture of alkaloids, obtained as a by-product from cinchona in the manufacture of quinine. It was used quite extensively in the early history of cinchona medication for malaria, owing to the high price of quinine, but its use was largely discontinued because of its pronounced tendency to disturb the stomach. However, Waters has been making experiments, laboratory and clinical, and reports it when properly administered, at least as effective as quinine, and free from the disturbing cinchonism or gastric disturbances. He reports daily doses of from 12 to 16 grains as generally at least as effective as quinine in acute cases, bringing down the temperature by the third or fourth day in the majority of cases. In chronic cases with enlarged spleens or in malignant tertian infections the author gives ammonium picrate grain one-half and arsenious acid grain 1/100 with the quinoidine. The quinoidine, he writes, can usually be increased to 24 grains daily without toxic symptoms. He reports a preliminary purge with calomel and soda should be given and offers the suggestion that quinoidine is much cheaper than quinine.

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**Local Anesthesia in Rectal Operations.**—Saphir, (*New York Medical Journal*, September 30, 1916), reports on a series of nineteen rectal operations at the Gouverneur Hospital under local anesthesia with quinine and urea hydrochloride solution, in all of which relief of their ailments without inconvenience either during or subsequent to operation were secured. All were able to leave the clinic immediately to attend to their usual duties. Saphir does not advocate this procedure in all rectal cases, but declares that about 75 or 80 per cent. of cases of hemorrhoids, external or internal, and those classed thrombotic, also rectal polypi, fissures of the anus, and ulcers, dermoid cysts, hypertrophied or other sphincter troubles, skin tags, some fistula ani and prolapsus ani, can be operated on by local anesthesia. The cases reported by Saphir prove that abnormal or diseased rectal conditions can be cured by this measure without the need of confinement to bed, a matter of very great importance from an economic view, both to the patient and the hospital. There is no objection to these operations under local anesthesia in those suffering from pulmonary tuberculosis, nephritic, or cardiac disease.

**Bromide Sedation in Epilepsy.**—Shahan of the Craig Colony for Epileptics, New York, (*Therapeutic Gazette*, November, 1916), contributes an interesting article on the above subject, and gives a table of the number of inmates from 1902 to 1915 inclusive, some 16,400, in which he declares that there has been a marked reduction in the quantity of bromides used for or during several years. Among the bromide preparations used were the various salts of potassium, sodium, and ammonium; bromipin, brometone, sabromin, and sedobrol. The patients were epileptics of all ages from infancy to advanced age, the majority being young adults. Duration of treatment varied from a few months to a great number of years; a slightly greater number of males over females. While the average dosage of bromide given was materially lessened, the average number of seizures did not increase.

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With the lessened administration of various preparations of bromine there has been, if any change, a lessening number of seizures, which with the general readjustment of every possible phase of the epileptic's life is of more importance than the indiscriminate use of sedation.

**Sulphur Vapor for Scabies.**—According to Bruce and Hodgson (*British Medical Journal*, Aug. 5, 1916) in the treatment of scabies the usual agents including sulphur ointment are too slow. For a year they have tried sulphur dioxide gas and found that this treatment is successful. This treatment is given in a cabinet made similar to the Turkish bath cabinet. The seat is made of three narrow crossbars placed 30 inches above the floor level. This will enable the gas to reach all portions of the buttocks and nates. The patient should first be well scrubbed, then placed in the cabinet and kept there for fifty minutes. The authors have treated over two hundred cases with about two per cent. returns; in these cases they are inclined to believe that some article of clothing escaped complete disinfection.

cutaneous injections of magnesium sulphate, and while he expresses his belief of the success of this treatment in controlling the spasmodic movements in tetanus, he cannot agree with Feliziani and Natoli who have reported encouraging results in chorea. Heiman treated five cases of chorea with daily doses of 0.01 to 0.2 gram magnesium sulphate per kilo of body weight, but did not observe sufficient improvement in the symptoms to justify further trial.

**Caution Against the Use of Emetine.**—Pellini and Wallace (*American Journal of the Medical Sciences*, Sept., 1916) discuss their findings after a pharmacological study of emetine in a series of experiments from which they arrive at the following conclusions: Emetine depresses and may eventually paralyze the heart; it is a powerful gastrointestinal irritant, given either by mouth or subcutaneously; it causes definite derangement of metabolism, characterized by an increase in nitrogen loss and acidosis; while in normal persons who receive moderate doses these effects may not be of importance, in pathological states of the circulation, intestinal tract or metabolism, they may be a definite source of danger.

**Treatment of Wounds with Carbon Tetrachloride.**—MacAuliffe, (*Bulletin de l'Academie de Medicine*, September 5, 1916) advocates carbon tetrachloride as an efficient and inexpensive substitute for benzine, ether, chloroform or alcohol in removing fatty substances from the skin around freshly made wounds. It does not mix with water, but a few drops may be placed on the surrounding skin and with hot water rubbed over it will remove greasy substances. It is neutral and stable under ordinary circumstances, is less volatile than chloroform, more energetically antiseptic, and not inflammable. Its odor is unpleasant to some, but this is obviated by the addition of a small quantity of menthol.

**Cyanocuprol in Treatment of Tuberculosis.**—In the August, 1916 number of the *Journal of Experimental Medicine* we find two articles on the above; one by Otani, the other by Koga. They agree that this treatment was in their hands quite successful. They declare that this agent can be more generally used than tuberculin. The patient in order to obtain the best results, should be placed under conditions of complete physical and mental rest after the injection which is intravenously. Care should also be given to securing rest for the lesion. During treatment with cyanocuprol, potassium iodide, tuberculin, guaiacol and its derivatives and iodol should be avoided. No marked idiosyncrasy or accumulative effects were observed. The dose must be regulated by the pathological phenomena and constitution of the patient: 10 to 12 mg. will probably be the minimum dose and this gradually increased as indicated by its reactions, etc.

**Magnesium Sulphate in Chorea.**—In the *American Journal of Diseases of Children* (August, 1916) Heiman states his experience in five cases of chorea by Meltzer's method of treatment of tetanus by sub-

**The Internal Secretions in Relation to Laryngology and Otology.**—The internal secretions and their relations to pathogenesis, physiology, and therapeutics deserve our most serious study, says B. R. Shurly (*Jour. A. M. A.*, Dec. 9, 1916) in discussing thyroid disease in relation to the nose and throat. "The rôle which they assume as oxygen carriers and active principles of stimulation to the blood cells of the body deserve our interest. Their rôle as immunizing and sensitizing agents is worthy of increased scientific interest. Their influence as governors over the vaso-motor centers and regulators of harmony in the functions of the lymphoid tissue of the throat is indeed significant.

We are unable as specialists to unravel many of these great mysteries of biochemistry. We must call on our laboratory colleagues with the spirit of research and untiring devotion to scientific investigation to solve these problems for us. Individually we can offer only our clinical mite. Yet it would seem that the laryngologist and the otologist have sufficient interest in the newer fields of organotherapy and pathology of the ductless glands to demonstrate that the thyroid and the tonsillar ring are involved in such a delicate and complex interrelationship that our special opinion in this field of research may, we hope, soon prove sufficient to call the attention of the internist, the neurologist, and the general surgeon to the fact that an examination of the nose, throat, ears and larynx is at least, in all modesty, worth the effort."

**The Control of Nausea and Vomiting with Corpus Luteum Extract.**—It is doubtless true as Hirst (*Jour. A. M. A.*, Dec. 16, 1916) asserts that every woman, during the

period of sexual activity, is constantly absorbing corpus luteum. No sooner is the corpus luteum of one menstruation disposed of, than another appears to take its place. With the onset of pregnancy, this absorption ceases. The corpus luteum of pregnancy constantly increases in size, until it reaches its acme about the third month. From this time on, it is gradually absorbed. The nausea of pregnancy, beginning during the period of nonabsorption, disappears about the time that the corpus luteum begins to decrease in size. Is it not reasonable to assume that this is not coincidence, but cause and effect, and that the corpus luteum plays an important part in relation to the nausea?

Based on this idea, corpus luteum extract was administered intramuscularly, with results of a very gratifying character.

Hirst reports the outcome in twenty-five consecutive cases, taken without any attempt to choose the favorable or eliminate the unfavorable. It was successful in controlling the nausea and vomiting in twenty-one of the twenty-five. In four it proved a complete failure, and did not in any way check the vomiting.

**The Pineal Gland.**—Within the last few years says Feuger (*Jour. A. M. A.*, Dec. 16, 1916) the pineal gland has attracted some attention as a result of experiments conducted by Dana and Berkeley, and McCord. They fed this gland to young animals such as dogs, guineapigs, chicks, rabbits, cats, etc., and found that it caused them to outgrow the control animals, both in size and in sexual maturity. The addition of even small amounts of desiccated gland to the food is stated to be sufficient to produce marked results. It has also been found that infant glands are more active and give better results than adult glands.

The present investigation was carried out for the purpose of determining the constituents and physiologic activity of this gland and to ascertain if any difference exists in glands from different species and between glands from young and from mature animals.

Comparisons have been made between pineal glands from cattle, sheep and lambs. It was found that beef glands are relatively small and that both sheep and lambs contain much more pineal tissue per unit of body weight than do cattle. Infant glands contain less phosphorus and more total nitrogen than adult glands.

Pineal glands from both species show only slight contracting power on unstriped muscle. This is very much less than that produced by equal amounts of the posterior lobe of the pituitary body, and not sufficient to be of physiologic significance.

Since the actions of pineal glands, both on the blood pressure, the pulse rate and the excised heart, as well as on the uterine and intestinal muscle, are insignificant in therapeutic doses, and since health is not influenced by extirpation of the gland, it becomes difficult, at least with our present knowledge of physiologic chemistry, to accept or even consider the pineal body as an internal secretory organ of medicinal value.

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**Anterior Pituitary Gland in Graves's Disease.**—Quite a good deal of experimental study is being given to the therapeutic possibilities of the glandular portion of the pituitary body—the *pars anterior*. Without a doubt it is a potent therapeutic weapon; and its usefulness is not limited to those cases in which there is definite pituitary disease where the gland feeding is given to remedy the metabolic and nutritional effects of obvious hypopituitarism.

Several preliminary reports of the utility of this remedy are appearing in current medical literature and most recent of these is an article by Richter, of St. Louis, entitled "A New Treatment for Graves's Disease" (*Med. Herald*, Sept., 1916, p. 307) in which he reports a number of cases of exophthalmic goiter which seem to have been very definitely benefited by varying doses of desiccated anterior pituitary gland.

No very good explanation is offered as to

how the reported therapeutic benefit is brought about; but we know that there is a well established relationship between the thyroid and the pituitary and that the ductless glands are apt to compensate each other when the normal balance is disturbed. Richter supposed that there may be an overcompensation which in the matter under consideration may be the basis for the future explanation of the value of this new form of treatment.

In any event it is interesting to note that Richter recommends 15 to 25 grains of this powder three times a day, coupled, of course, with the rest and usual hygienic care. He remarks that the several patients treated were all workers and the advice regarding rest "was only rarely followed" and all the cases continued their usual avocations during the course of treatment. As a result of this the major and minor symptoms gradually became less prominent, the facial appearance was changed, the nervousness was reduced, the pulse rate decreased in an encouraging manner and the whole symptom-complex was decidedly modified for the better.

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**Some Essentials Concerning Organotherapy.**—At the recent meeting of the Medical Society of New Jersey, the address of one of the officers was entitled "Organotherapy" and it contained much of interest to those who realize how important this growing subject is becoming. It may be of advantage to repeat several conclusions made by the author, Dr. T. W. Harvey of Orange, and in so doing urge their importance:

1. Good health is the autonomous balance maintained by the ductless glands thru the agency of their secretions in the control of the metabolic processes of the body.
2. Several well defined diseases due to ductless glandular deficiency can be cured by glandular feeding.
3. There are many functional deviations from the norm that can be corrected by administering certain extracts of the ductless glands, the specific extract to be used depending upon its physiological effects.
4. Many of these functional deviations are due to abnormal conditions in more than one of the ductless glands. (Parenthetically

this might be extended to include *all* such disorders for the slightest change in the "hormone balance" must affect more than the originally disordered gland.—Ed). There may be pluriglandular disease and there should be pluriglandular therapeusis.

5. As these secretions act as hormones, the administrator should copy the natural processes as nearly as possible, giving small and continued dosage.

6. Organotherapy is a two-edged sword, much harm may follow its injudicious use. On the other hand, when the proper indication is recognized and followed with care, the results often seem magical.

7. The value of organotherapy is very marked in mild cases of glandular deficiency. It is, therefore, most important that the condition should be recognized early so that the deficiency may be corrected before organic changes have resulted from the functional derangements secondary to such deficiency.

**Freudian Ethics.**—The application of Freudian doctrine to ethics has been made by Edwin B. Holt (*The Freudian Wish*, Henry Holt & Company). His study of the doctrine of the "wish" together with his analysis of the physiology of wishes serves to form the basis of his argument that the wish or purpose is a unit of conduct which ethics ought to regard as fundamental, whatsoever, then, further argument is to be as to the nature of the good or the source of moral sanction.

"Now the Freudian ethics is a literal and concrete justification of the Socratic teaching. We have seen throughout that truth is the sole moral sanction, and that the discrimination of hitherto unrealized facts is the one way out of every moral dilemma. This is precisely to say that virtue is wisdom. Freud gives the subject a more concrete psychological analysis than did Socrates or Plato; and he proves the doctrine to hold in the special case."

Freudian ethics presents mind itself as an evolution, and morals as one of the higher

stages of this process. The sanction of morality lies in the discrimination of facts apart from emotion. Freud's discovery of the "wish," reveals the articulate unit of mind and character. The study of the Freudian wish with its repressions and discriminations will serve to advance real moral conduct.

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**Human Character and Temperament.**—Medicine has been enriched thru the discoveries of psychologists. The interpretation of human character and temperament is an essential in education. The analysis of human disorders and impulses, their ambitions and potentials is requisite as a basis of character training. Temperamental differences and the results of the interaction of character and environment are involved in the adjustments necessary for the highest development of human beings.

Jastrow (*Character and Temperament*, D. Appleton & Company) has effectively, tho with considerable redundancy in literary form, discussed the psychological sources of human quality. The development and meaning of the sensibilities, the problems of emotions and conduct, and the higher stages of control are most excellently revealed and elaborated.

The essential qualities of men determines their power for good or evil. The plasticity of human nature in its higher reaches is the psychological guarantee that man's progress is upward.

True appreciation of the qualities of men by an optimist, such as Jastrow, is well expressed in the words of William James which he quotes.

"Though it is no small thing to inoculate seventy millions of people with new standards, yet, if there is to be any relief, that will have to be done. We must change ourselves from a race that admires jerk and snap for their own sakes, and looks down upon low voices and quiet ways as dull, to one that, on the contrary, has calm for its ideal, and for their own sakes loves harmony, dignity, and ease."

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**Mothercraft.**—Maternity may represent the fulfillment of an instinct. Mothercraft is the expression of maternal education. The mother becomes such thru physi-

ologic causes. Her function as a teacher is aided thru the study of the physiology of her child, its needs, and the methods of affording it the most healthful environment.

With discussions varying from pre-natal care to the Sunday supplement, from the principles underlying the founding of a family to a discussion of toys, Mary L. Read (*The Mothercraft Manual*, Little, Brown and Company) represents the breadth of a curriculum for mothers.

The physical, mental and moral care of children is excellently discussed in a systematic and orderly way by the author, whose wide experience has enabled her to apply reason and common sense to the problems which arise in every home boasting children.

**Dreams.**—The theory of dreams, as elaborated by Freud, enriched our knowledge of the etiology of neuroses. The psycho-analytic school which now numbers many pupils is yielding valuable material for the psycho-therapist.

"At the bottom of every dream there lies a repressed wish in the unconscious, a wish which may appear disguised in the dream, and which can only be interpreted by an analysis of the dream. The theory that every dream represents the fulfillment of a repressed wish is one of the most important contributions of the psycho-analytic school but it can be well substantiated by practical experience in dream-analysis."

The value of Coriat's book (*The Meaning of Dreams*, Little, Brown & Company) rests upon not merely the exposition of dream-analysis, but the development of the methods of psycho-analysis thru the interpretation of specific dreams by means of which the author reveals the hidden motive and desires, which gave rise to them.

The importance of dream interpretation is succinctly expressed in a paragraph in the concluding chapter.

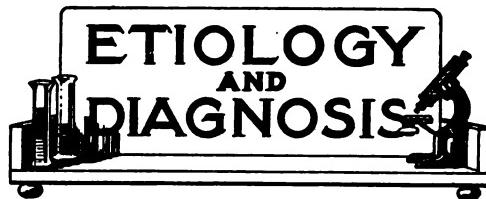
"The end of all psycho-analysis is twofold: first, to educate the patient to become an independent personality by directly freeing him from his neurosis and therefore from his infantile limitations, so that when the dependence of the physician is cut off, the patient can be put on his own feet, so to speak; and secondly, to relieve the repressed emotions so that they may be indulged in freely and unhampered, partly by conscious control and partly by conducting those emotions to a higher and less objectionable goal. This last process is termed

sublimation, and if properly carried out in the hands of a skilled psycho-analyst, the repressed instincts become unchained and thereby can no longer produce a neurosis, and the conflict between repression and the attempt on the part of the individual to find an outlet for the repression, which is the process that causes the nervous malady, disappears."

**The Expectant Mother.**—The book for *The Expectant Mother* by S. W. Bandler (W. B. Saunders Company) does not represent an effort satisfying the needs for such a volume. It is far too elementary for physicians, not satisfactory in the sense of covering the needs of the expectant mother, and not fully adapted for the requirements of nurses.

There is a gynecological trend to the book which is too pathologic for pregnant women, who desire to learn the facts of nature with reference to their condition, and at the same time to maintain a normal state of mind.

Such practical problems as bathing, clothing, work, rest, and exercise are items upon which intelligent parenthood desires enlightenment, but on these subjects, the author is profoundly silent.



**Etiology of Uterine Prolapse.**—Fitzgibbon, in the *Surgery, Gynecology and Obstetrics*. (July, 1916), as a result of his experience and study of uterine prolapse draws the following deductions:

Prolapse of the uterus and cystocele is due to damage of the pelvic fascia in the region of the lateral fornices and in front of the cervix.

Prolapse of the uterus must be clearly differentiated from cystocele; they may exist separately or be combined.

Laceration of the perineum and levator ani muscles has no part in the production of prolapse. It allows an increase of cystocele when there is the primary defect.

Retroversion of the uterus has no tendency to produce prolapse.

Prolapse of the uterus and cystocele is analogous to abdominal hernias through scars, due to defective union of the fascia.

The cure of the condition can be effected by reuniting the fascial diaphragm across the pelvis.

The fascial diaphragm can be repaired without interfering with the function of the uterus or dislocating the bladder.

The condition can be treated in exactly the same manner before and after the menopause.

Atrophy of the uterus has no influence upon its support.

Amputation of the cervix other than the removal of a hypertrophied lacerated vaginal portion is not necessary.

**Primary Carcinoma of the Lungs.**—Forman (*Medical Record*, Sept. 9, 1916) points out from statistics he has gathered that this condition is more frequent than is usually supposed. Adler was able to collect only 374 authentic cases from the literature up to 1912, therefore as 120 cases have been reported since that time it is apparent that earlier statistics were defective. The majority of the so-called cases of primary carcinoma of the lungs are really of bronchial origin, while a casual microscopic examination may lead to a diagnosis of sarcoma in certain cases of lung carcinoma. Four cases are reported by the author, occurring in males aged from forty-eight to sixty years in all of whom the lifetime diagnosis was that of tuberculosis and the true pathological condition discovered only at autopsy.



**Treatment of the Discharging Ear.**—Bardes in the *Med. Record*, (Sept. 30, 1916) states that beginning otitis media may frequently be aborted by an ice bag, a mild cathartic, fluid food, rest, and hourly irrigation of the ear with a warm boric acid solution. Earache should not be allowed to last longer than twelve hours before incising the drum, and this should always be done under general anesthesia and preferably under chloroform. After incision, ordinarily it is simply necessary to keep the ear dry and clean, and irrigations should be used sparingly or not at all. A saturated solution of boric acid with some alcohol added makes a good lotion. The use of ear drops without an exact diagnosis of the nature of the lesion is unscientific, and hydrogen peroxide is especially contraindicated. Persistent discharge may require stronger applications, such as a twenty per cent. solution of iodine or a ten per cent. solution of chromic acid. The radical mastoid operation of Stacke is of value only in selected cases, and the best

statistics show only fifty per cent. in cures. A better operation in most cases is the Schwartz operation, with removal of the mastoid cells and the establishment of free connection between the mastoid antrum and the tympanic chamber.

**A Bladder Sedative.**—As a bladder sedative in the milder cases (*Med. Standard*, Nov., 1916) where there is vesical spasm, frequency of micturition, or pain; at the early onset of simple cystitis; in slight bladder chill giving rise to abortive cystitis; in urinary irritation, and in the irritation caused by hyperacidity; in prostatic irritation, and in most forms of bladder irritability, except where there is strong alkaline decomposition.

R Potass. Citrat. .... grs. x-xx  
Sodii Bromide ..... grs. x-xx  
Tr. Belladonnae ..... m v-xxv  
Tr. Hyoscyami ..... m xx-xxi  
Elixir Uritone Co. (P. D. &  
Co.) ..... 3*i*-3*ii*  
Infus. Buchu (recentis). ad 3*i*  
Misce. Ft. mist.  
Sig.: Two tablespoonfuls in water every  
four or six hours.

**The Treatment of Gastric Ulcer.**—Weiss in his interesting discussion of gastric ulcer, (*New York Med. Jour.*, Dec. 16, 1916), says that its treatment is principally dietetic and hygienic. Post mortem examinations show that a large number of ulcers heal completely, but the process is slow and tedious, often requiring months, and in severe cases years. In the medical treatment the following are the important points:

1. Absolute rest in bed for three or four weeks.

2. A carefully and systematically regulated diet. Absolute functional rest of the stomach and upper bowel for a week or ten days, the patient being meanwhile nourished exclusively by rectal feeding, or when the patients are fairly strong I have found a complete fast for some days at first to be still more effective. Theoretically, it is better to give the stomach an entire rest, but practically this cannot be done. When stomach feeding is resumed the diet should be limited for the first week to milk given in quantities of from four to twelve or even sixteen ounces, every two to three hours, with one sixth part of lime water or vichy water. Then, by the end of two weeks, it is safe to add to the daily ration one or two raw eggs, beaten thoroughly, instead of the alkaline water. Leube's ulcer diet is at the present time highly esteemed. Later the blander preparations of beef, mutton, etc., in the form of finely chopped meat rather than broths may be substituted for part of the eggs, and prunes and vegetables may be added. Still later, mashed or baked white potatoes and the other more digestible vegetables, better chopped at first, may be allowed. But all meats are very stimulat-

ing to the gastric glands, and the amount of such foods allowed should be strictly limited.

No ulcer patient should ever be dismissed without an emphatic warning that he cannot afford to risk relapse by again eating indiscriminately, including pepper, mustard, and other condiments in his fare.

3. Medicinal measures are of little value. Bismuth and nitrate of silver may be given. From ten days to two weeks bismuth subcarbonate may be given in doses of from twenty to thirty grains three or four times a day in an emulsion with water and milk. If pain should persist in spite of these measures, sufficient bicarbonate of soda should be given to neutralize the hyperacidity. Opiates should not be given, since they all stimulate the secretion of hydrochloric acid, and thus tend to aggravate peptic ulcer. Locally, either dry heat or hot poultices should be kept over the abdomen, except in hemorrhage, and then the patient should quickly be brought under the influence of morphine. This puts the parts at rest. Ice may be applied to the epigastrium and horse serum administered.

Practically, all internists and all except a few of the more radical surgeons, now concur that rest and dietetic treatment, with the help of bismuth and alkalies as required, should certainly first be given a trial, especially in simple cases which have not been neglected for many years.

There are many cases in which a cure is not possible, although they may have received the most careful dietetic, hygienic and medicinal treatment, and whenever there is uncontrollable vomiting or hemorrhage, or evidences of perforation, stenosis, or obstruction from any cause, there should be an immediate resort to surgery.

**Treatment of Acute Abdominal Pain.**—In his interesting article in the *West Virginia Med. Jour.* (Dec., 1916) Miller says the treatment of intestinal obstruction no matter in what form or from what cause, is early laparotomy. A median or right rectus incision below the umbilicus, which can be easily enlarged either up or down according to the pathology found, is the best, unless a hernia or tumor indicates some other point of entrance more advantageous. The intestines should be handled gently always, and when the lesion is found, if not due to constricting bands holding the gut down, the intestines should be gently delivered out of the abdomen and kept covered and warm during the operative procedure. If due to constricting bands they should be severed and cut off closely at both ends so that nothing is left to give future trouble.

In conditions of gangrene or sufficient bowel destruction to demand resection, the surrounding cavity should be thoroly walled off with moist gauze to prevent soiling of the peritoneal cavity. In resection we should be careful to go far enough to get healthy gut with good blood supply. Miller prefers to do the end to end anastomosis with suture and use no mechanical means, and if carefully done we will get better

results. The mesentery should be carefully closed so as not to interfere with the blood supply at the point of resection. After carefully and gently cleansing the intestines they are replaced in the cavity with the resection line fairly close to the abdominal incision so that if we are not sure about leakage or probable soiling of peritoneum, we can insert a small drain down to but not quite touching the line of sutures, which can be removed at the end of forty-eight hours or as soon as we believe advisable in each case. Certain cases of intestinal obstruction come to us so late that on account of the great distention of the intestine and poor condition of the patient we will have to be satisfied with a simple enterostomy above the point of obstruction, which often saves a life when further manipulation would put our patient over the border line, and a few days later, we may be able to repair the lesion.

**The Correction of Fallen Arches.**—Stephenson in the *Indianapolis Med. Jour.*, (Nov., 1916), outlines his procedure of taking an impression of the bottom of the foot with a modelling compound, such as is used in dental laboratories. From this impression a plaster cast is made, being trimmed down before hardening to the shape and length desired, according to the location of the trouble in the particular foot being treated; it is necessary for the arch support to be very much longer when the disorder is in the transverse arch. After the cast is sufficiently dry there is built over it the arch support, using for this purpose a hardening cement which is not affected by moisture, perspiration or heat under 300 degrees. The amount of cement used is governed by the weight of the patient. After going through a curing process extending over several days' time the arch support has the proper flexibility where it is needed, and is very firm where it is desired to have it rigid. The skeleton of the arch support is then covered with thin leather giving it a neat finish. This leather covered arch support is light in weight, it does not change in shape as do those made of leather and steel, it is comfortable, and can be remodeled by the aid of moist heat to suit the improved foot. The writer says that the results he has obtained with this method are most gratifying.

**The Correction of Weak Feet in Pregnancy.**—In discussing the treatment of weak feet or rather the feet during pregnancy and the puerperium, Grossman (*Med. Record*, Dec. 16, 1916) divides the subject into prophylactic and curative.

A. Prophylactic: (1) Proper footwear. Before describing in detail the shoe which has proven very satisfactory in pregnancy and the puerperium, a brief review of some of the possible conditions which may arise during these periods would not be out of place. We know that the circumference of the legs of many pregnant women vary from one part of the day to the other. Women will arise in the morning

with very little or no swelling of the legs and as the day advances swelling appears. Very often associated with weak feet is a breaking down of the anterior arch. At times patients slip and fall, sustaining sprains and fractures; again they may trip because their heel catches in carpet, rug or their dress when they ascend or descend stairs. The added strain of pregnancy may aggravate an existing valgus of the feet, or if one is not present, produce one in a foot which has already been abused by improper foot wear. A proper shoe to obviate these conditions and accidents should be constructed as follows:

(a) There should be an expansion top to compensate for any degree of edema. (b) An eighth of an inch elevation in the inner border of the sole and heel to overcome the valgus or prevent one. (c) A cross bar of an eighth of an inch in the anterior metatarsal transverse arch to relieve and prevent metatarsalgia. (d) A cushion rubber lift in the heel between the top lifts and the under lifts to give soft and jar-relieving steps when walking. (e) A special anti-slip finish to the bottom of the sole and heel so as to prevent slipping and subsequent injuries. (f) Rounded heel edges to prevent catching in carpet, rug or dress in ascending or descending the stairs. (g) Must be built on anatomical principles so that the body weight bearing is evenly distributed on the feet. (h) The heels must be of the height most comfortable to the patient. (i) Should be built so that they can be worn all day without requiring a change to low cut shoes or slippers.

The shoes which we prescribe and recommend, fulfill these requirements and have proven very satisfactory. They are designed for us by Mr. Max Deutsch of this city.

2. Exercises. Exercises should be practiced twice daily and should not be carried to the extent of tiring the patient. Walking should be encouraged as much as possible.

Tiptoe exercises: The patient places the limbs in the attitude of moderate inward rotation, raises the body on the toes to the extreme limit, the legs being fully extended at the knees, then sinking slowly, resting the weight on the outer borders of the feet in marked varus, repeating about twenty to thirty times. This exercise if practiced faithfully is all that is required.

B. Curative: The two types of weak feet which we commonly meet with in pregnancy and the puerperium are the spastic and the non-spastic. In the nonspastic passive motion of the foot is painless and free to the normal limit. In the spastic type passive motion is painful and restricted. The treatment of the nonspastic type consists of proper shoes and exercises. As a rule these suffice; at times it is necessary to supplement these with Whitman's braces.

In the spastic type of weak feet strapping, shoes, and Whitman's braces are necessary. A very good method of strapping follows: one end of a strip of adhesive plaster, about 15 inches long and 3 inches wide is applied to the outer side of the ankle just below the external malleolus; the foot is then adducted as far as possible and the plaster is drawn tightly beneath the sole up the inner side of the arch and the leg;

it is kept in this position by one or two plaster strips about the calf. Narrow strips are then applied about the arch and ankle in a figure of eight manner. Strapping should be done twice a week and continued until the spasm and rigidity have been overcome. When this has been accomplished the brace and proper shoes should then be prescribed.

**Value of Oysters.**—Stutzer in a recent issue of the *N. Y. Med. Jour.*, maintains that it takes fourteen oysters to contain as much nourishment as one egg, and two hundred and thirty-three to equal a pound of beef. Their cost is triple that of beef (and more than triple that of some other proteins).

**Tissues Made Transparent.**—A new method of giving medical students instruction, which, it is said, will largely obviate the necessity of dissection, will be put into practice at the Hahnemann Medical College, Philadelphia, at the beginning of the next term (*Practical Medicine*, August, 1916). Physicians and surgeons connected with the department of anatomy are now perfecting the process, which originates thru the recent discovery by a French scientist of a fluid by the use of which the human body can be rendered transparent. The fluid, which is composed of several oils, turns the flesh into a sort of transparent jelly when injected, enabling the students to study the veins, muscles, and bones far better, it is asserted, than if they resorted to the dissecting knife. It is said to be one of the most valuable discoveries in medical science of late years.

**Water Drinking at Meals.**—Cutler in a recent issue of *Boston Med. and Surg. Jour.* reports that the daily consumption of about three quarts of water with meals for a period of five days, in a young man of 22 years, caused an increase of two pounds.

The free use of water at meals, according to him, seems to increase the flow of digestive fluids, to increase peristalsis, and to hasten absorption, while the fats seem to be more completely digested. Dilution does not diminish the action of the digestive fluids, for the reason that enzyme action is greater (within limits) the greater the dilution. The author concludes, as the result of his clinical observation and laboratory research, that it is desirable for persons in ordinary health to drink water with meals as

desired, or to the extent of two to four glasses at each meal, provided the food is well masticated.

**Precautions in Caudal Analgesia.**—Before injecting the analgesic fluid, says Bransford Lewis and Leo Bartels in *The Lancet-Clinic*, we must be sure that the needle has not entered the spinal canal or one of the large veins constituting the plexus about the cauda. If the spinal canal has been entered spinal fluid will usually escape after the withdrawal of the obturator from the needle, while, on the other hand, if a vein has been punctured blood will drop from the needle. If neither blood nor spinal fluid escape, the analgesic fluid still should not be injected until we have tested the location of the end of the needle by injecting a few drops of normal saline solution through it. The authors have had a very unpleasant warning on this point which could have been obviated by such preliminary injection of saline solution. In this case the needle was introduced in the usual manner and injection was begun, but after about 10 c.c. was injected the patient complained of weakness, extreme pain in the head and chest, and his pulse became somewhat weak and irregular. The injection was stopped at once, and, on detaching the syringe, blood was seen to run from the needle. The patient soon recovered and left the hospital about three hours later, feeling very well. In this case the needle had entered a vein, but the blood was retarded from flowing out by a small clot or piece of tissue which had occluded its lumen. If saline solution had been injected before using the analgesic fluid the obstructing plug would have been washed out and the blood escaping from it would have indicated a vein had been entered. If either the spinal canal or vein has been punctured the position of the needle should be changed before injecting the analgesic fluid. Having the needle properly placed, 30 to 90 c.c. of analgesic fluid is slowly injected. Analgesia becomes complete in from ten to thirty minutes, and lasts several hours. By increasing the quantity of fluid the entire sacral plexus may be included.

**Fruit Juice for Atrophic Infants.**—Fruit juice, says Gladstone, *London Practitioner*, November, 1916, can be taken to the extent of a pint daily, with immediate benefit to a dyspeptic atrophic infant under 1 or 2 years of age. A carefully selected food low in albumin and fat and high in sugar, will then be both digested and absorbed and result in gain of weight. At first a loss of weight must be expected, but, by the end of the first week, this is usually regained. Unless the juice is followed by a diet scientifically adapted to a weak digestion, it does no permanent good whatever. The juice, no doubt, acts partly on account of its acid reaction, rendering the bowel unsuitable for germs growing in an alkaline medium. It has a tonic, cleansing effect on the mucous membrane of the

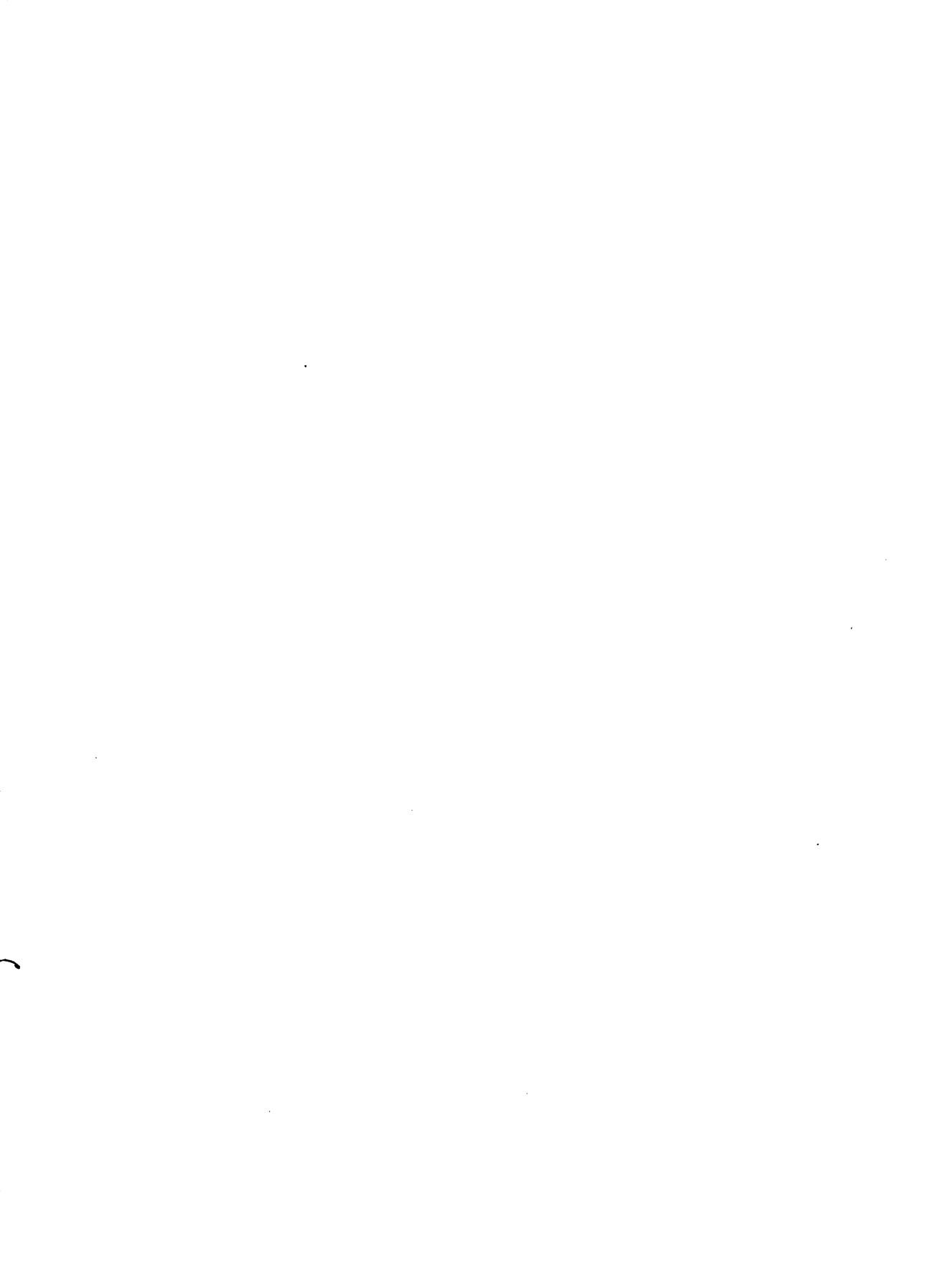
digestive tract, and is a diuretic, diaphoretic and general alterative. It supplies an attractive drink, enjoyed by all babies, containing 10 per cent. of soluble carbohydrate food, removes the irritability and restlessness of the child, promotes quiet sleep, and renders the digestive organs able to digest and absorb a light diet. While oranges were available, the juice was made of two parts of orange juice to one of apple juice, diluted with one quarter the quantity of water; the apple juice was obtained by shredding apples on a vegetable grater, and expressing the juice by means of a fruit press. Melon and apple juice has been used with somewhat less good results. Strawberry, cherry, raspberry and banana juices have been taken and enjoyed by the babies and did not produce any bad effects, and it is probable that any fruit juice available would succeed, provided the acid fruits were not used in too large a proportion, and that when oranges are out of season it will be found advisable to add a small quantity of lemon juice to the sweeter fruit juices, to supply the necessary acidity.

**A Domestic Remedy for Whooping Cough.**—*The New York Medical Journal*, of Aug. 5, 1916, contains a rural remedy for whooping cough, communicated by T. Mark Hovell, of London, to the *British Medical Journal* for July 1st. Peel the cloves of garlic, cut them into thin slices and wear them under the soles of the feet between two pairs of socks (if placed next the skin the pressure produced by walking is apt to cause irritation). The garlic can usually be smelt in the breath within half an hour after the slices have begun to be worn, and the whoop and spasm usually disappear within forty-eight hours. The garlic should be worn for a week or ten days or longer, according to the severity of the case. Among the French Canadians onions are used in exactly the same way. Garlic may also be administered by eating it as a form of bread sauce, made by chopping up the peeled cloves, boiling them in milk, and mixing them with bread-crumbs.—*Critic and Guide*.

**Removing Rust from Surgical Instruments.**—The following is said to answer admirably:

Potassium Cyanide .....	16 parts
Chalk .....	30 parts
Soap, shaved .....	15 parts
Water .....	sufficient

Dissolve the soap in sufficient water to make, with the chalk, a thick paste, in which incorporate the cyanide. With this paste rub the blades well until the dust disappears and a polished surface is attained. The operation is rendered more rapid if the blades or other objects be soaked in kerosene over night and the surface rust scraped off with anything that will not scratch the blades. The deadly nature of the scouring paste must, of course, always be borne in mind, and the proper precautions always taken to protect the hands.—*Critic and Guide*.









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